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Baseline Study of Title II Development Food Assistance Programs in Guatemala

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List of Acronyms

ADIPO	Asociación de Desarrollo Integral para el Occidente
AIEPI AINM-C	Integrated Care for Children and Women at the Community Level
ARI	Acute Respiratory Infection
BMI	Body Mass Index
CRS	Catholic Relief Services
DHS	Demographic and Health Survey
ENCOVI	Encuesta Nacional de Condiciones de Vida
ENSMI	Encuesta Nacional de Salud Materno Infantil
FANTA	Food and Nutrition Technical Assistance III Project
FFP	Office of Food for Peace
FGD	Focus Group Discussions
GPS	Global Positioning System
GTQ	Guatemalan Quetzal
HAZ	Height for Age Z-Score
HDDES	Household Dietary Diversity Score
HHS	Household Hunger Scale
IDEI	Instituto de Estudios Interétnicos
IDI	In-Depth Interviews
INE	Instituto Nacional de Estadística
IV	Independent Variable
IYCF	Infant and Young Child Feeding
KI	Key Informant
LCU	Local Currency Unit
LSMS	Living Standards Measurement Survey
MAD	Minimum Acceptable Diet
MSPAS	Ministerio de Salud Pública y Asistencia Social
NRM	Natural Resource Management
OLS	Ordinary Least Squares
OR	Odds Ratio
ORS	Oral Rehydration Salts
ORT	Oral Rehydration Therapy
PAISANO	Programa de Acciones Integradas de Seguridad Alimentaria y Nutricional del Occidente
PDB	Potential Direct Beneficiary
PPP	Purchasing Power Parity
PPS	Probability Proportional to Size
PVO	Private Voluntary Organization
SC	Save the Children
SEGAMIL	Seguridad Alimentaria Enfocada en los Primeros 1,000 Días
SPSS	Statistical Package for the Social Sciences
TBA	Traditional Birth Attendant
UN	United Nations
UNICEF	United Nations Children's Fund
USAID	U.S. Agency for International Development
USD	United States Dollar
WASH	Water, Sanitation, and Hygiene
WFP	U.N. World Food Program
WHO	World Health Organization

Executive Summary

Overview of the Baseline Study

In Fiscal Year 2012, the U.S. Agency for International Development (USAID) Office of Food for Peace (FFP) awarded funding to private voluntary organizations (PVOs) to implement multi-year Title II development food assistance programs in the most food-insecure regions of Guatemala. FFP issued two awards: one to Catholic Relief Services' (CRS) Seguridad Alimentaria Enfocada en los Primeros 1,000 Días (SEGAMIL) program in San Marcos and Totonicapán departments; and the second to Save the Children's (SC) Programa de Acciones Integradas de Seguridad Alimentaria y Nutricional del Occidente (PAISANO) program in Quiché, Huehuetenango, and Quetzaltenango departments. The main purpose of these Title II programs is to improve long-term food security in the Western Highlands.

In line with the USAID Evaluation Policy, FFP contracted with ICF International to carry out a baseline study in communities in the Western Highlands region of Guatemala where CRS and SC will implement these programs. This baseline study is the first phase of a pre-post evaluation survey cycle. The second phase will include a final survey conducted in five years, when the Title II programs are completed. The baseline study includes two components: (1) a representative population-based household survey to collect data for key FFP and program-specific indicators; and (2) a qualitative component to gather additional data that adds context, richness, and depth to understand the results from the household survey. The results from the baseline study will be used for the following purposes:

1. Establish baseline values of key FFP and program-specific indicators prior to implementation of the Title II programs;
2. Assist the PVOs in establishing target levels for improvements in these indicators over the five-year Title II program cycle;
3. Inform PVOs about the current food security situation so they can refine their program design and implementation strategies and improve efficiency by targeting the areas and subgroups that will benefit most; and
4. Provide FFP baseline indicator values that can be compared across countries through meta-analyses of the indicator results.

The population-based household survey sample is designed to statistically represent the beneficiary communities selected for implementation by each respective PVO in their designated geographic regions of operation. The multi-stage clustered sampling design yielded a household sample size of 3,000 per program or 6,000 households overall. ICF developed and finalized the questionnaires and training materials based on consultations with FFP, the Food and Nutrition Technical Assistance III Project (FANTA), and the PVOs. The fieldwork, including training, data collection, and data entry, began in mid-January 2013 and concluded in June 2013.

The qualitative study component was conducted during the same time frame as the population-based household survey. The qualitative team visited eight communities and conducted in-depth interviews (IDIs) and focus group discussions (FGDs). The team also conducted formal interviews and informal conversations with key informants (KIs) who had insights into health and nutrition, as well as livelihood development in the communities where the SEGAMIL and PAISANO programs are taking place. The team used five question guides to conduct the IDIs and FGDs. The team conducted six FGDs and 24 IDIs with potential direct beneficiaries and eight IDIs with KIs.

Limitations and challenges experienced during the baseline study include a compressed timeline, difficulty obtaining current household counts at the community level and maps from existing data sources, difficulty recruiting experienced local interviewers in the Western Highland region, logistics and transportation constraints, difficulty accessing some communities, the length and complexity of the household survey questionnaire, and concurrent fielding of the qualitative and household surveys.

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Key Findings

The baseline study findings cover seven broad areas: (1) characteristics of the population; (2) household hunger and dietary diversity; (3) poverty levels; (4) water, sanitation, and hygiene; (5) agricultural practices; (6) women's health and nutrition; and (7) children's health and nutrition.

Characteristics of the Population

The majority of the population in the Western Highlands of Guatemala is indigenous or of Mayan descent. Individuals in this region speak a variety of languages, including Ixil, Quiché, Mam, Popti, and Spanish. Trends in the qualitative data indicated migration can and does influence the make-up of communities. While there are clear benefits to migrating both for the family and community (such as increased income), negative outcomes include disintegration of the family; leaving women at risk of greater levels of poverty; and pain, sadness, and worry over family members who have left. The primary driver of both internal and external migration is a lack of income and job opportunities.

The household survey data indicated that the average household in the program area includes 6.4 household members. Children ages 0-59 months are household members in about 60 percent of all households and children ages 0-23 months are household members in 29 percent of households. Nearly half of all heads of household completed primary education and 43 percent have no formal education. Most households include an adult male and female (89 percent) or a single adult female (9 percent).

Household Hunger

Survey data collection took place during April to June, just prior to the start of the lean season, which typically occurs from June to August. A small minority of households (7 percent) suffers from moderate or severe hunger, with a similar prevalence in the SC and CRS program areas. Qualitative data indicate that accessibility of food is variable and influenced by a number of factors, such as the season (rainy versus dry), success of crop production, and access to an income that allows for the purchase of food.

According to qualitative data, respondents both purchase and produce food items, and sources of food vary significantly by household and season. Respondents stated that reduced plot size is a limiting factor in the diversity and quantity of their production. Strategies for coping with low yields as well as low household income include reducing food consumption and limiting dietary diversity.

Household Dietary Diversity

Household dietary diversity for survey participants is moderate, with about half of the 12 food groups consumed daily in each household. Foods made from cereals and grains are the staple of household diets and are consumed by nearly all households. The dietary diversity score as a measure of food access and socio-economic status indicates moderate economic means to allow access to a diverse selection of foods.

Qualitative data indicated that dietary diversity tends to decrease during the dry season. Respondents indicated that food items are both purchased and produced, and sources of food varied significantly by household and by season. Overall, both KIs and PDBs expressed the importance of additional income and food production as a way to increase access to more diverse foods.

Poverty Levels

Poverty is a significant challenge in the program areas of the Western Highlands region. The household survey found that nearly one-half (44 percent) of the population in the survey area is living in extreme poverty (less than \$1.25 USD per day), which is substantially higher than the 13.5 percent for Guatemala as a whole¹. Daily per capita expenditures are, on average, USD \$1.9 per day, per person.

¹ [World Development Indicators](http://data.worldbank.org/data/home.aspx). World Bank, July 9, 2012. Retrieved from <http://data.worldbank.org/data/home.aspx>

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Across all departments, respondents from the qualitative study identified few primary sources of income. These included small-scale agricultural production (both the sale of crops and animal rearing); casual and opportunistic labor; masonry; and work acquired through internal and external migration. In addition, respondents residing in communities in the CRS program area also mentioned selling textiles, handmade clothing, and handcrafts as additional sources of income. For both program areas, income sources vary and are unstable. Few respondents discussed being able to meet all household needs based on one source of income. In order to meet their household needs, respondents rely on diversifying their income sources or on pooled income from several members of the household.

The majority of male and female respondents in the qualitative interviews, across all departments, stated that men are the primary income providers, although women also bring income into the households. Common income sources for women include the keeping and selling of livestock, washing clothes for neighbors, and making clothing for sale. These types of tasks were reported to generally pay significantly less than those that men perform. In households where income is insufficient to meet household needs, children are also involved in income-generating activities or responsible for assisting parents in their income-generation activities.

Water, Sanitation, and Hygiene

Overall, 20 percent of households reported using an improved drinking water source. Although 48 percent reported having access to an improved water source, only 65 percent reported that water is generally available from the source. According to the survey results, nearly all households (93 percent) reported boiling water to make it safer to drink.

About half of households (52 percent) use a non-shared improved sanitation facility, generally a pit latrine slab (41 percent). Use of improved sanitation facilities in the program areas is lower than the nationally reported average of 78 percent.² In general, qualitative focus group and interview data indicated that the majority of individuals want to improve their existing latrines and that those who do not have latrines recognize their importance.

Household survey interviewers observed soap, detergent, or another cleansing agent at the place for hand washing in 77 percent of households. However, qualitative findings indicate that while hand washing with water takes place frequently, soap use is sometimes limited to instances where hands are visibly dirty. Respondents reported financial limitations to purchasing soap.

Agriculture

The majority of farmers (95 percent) in the household survey reported cultivating corn, and about two-thirds reported cultivating beans. Around a third (38 percent) of farming households cultivated herbs or vegetables for household consumption, and more than half (58 percent) reporting having fruit trees on their land. Livestock was raised in 87 percent of farming households. Qualitative data indicate that in most cases men are responsible for crop production and women are responsible for the rearing of fowl and animals.

Most farmers (92 percent) reported consuming products from their livestock or land, and 44 percent of farmers reported selling products from their livestock or land. Qualitative data identified three general trends for crop consumption and sales: (1) some communities produce certain crops exclusively for sale; (2) for most other crops, farmers sell their surplus after calculating their own need; and (3) the majority of livestock and poultry raised by individuals serve as sources of income, with about 20 percent consumed by the household.

² WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation (JMP), *Progress on Sanitation and Drinking Water, 2012 Update*. Retrieved from http://www.wssinfo.org/fileadmin/user_upload/resources/JMP-report-2012-en.pdf.

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Overall, 14 percent of farmers reported practicing at least two value chain activities, most commonly market-oriented production. A higher proportion (50 percent) of farmers reported using at least three sustainable agricultural practices, such as use of organic fertilizer or use of improved livestock facilities; however, only 8 percent of farmers reported using improved storage practices, such as grain silos. Only 16 percent of farmers reported using financial services in the year preceding the survey.

Key challenges to agriculture stated during qualitative research include a lack of financial resources to invest in products needed to improve yield (i.e., fertilizer, insecticides, and seeds); lack of technical assistance to help improve practices; lack of access to a reliable water source; and insufficient access to vaccinations for animals. Additionally, respondents reported lack of access to adequate land and lack of organization and cooperation among farmers.

Women's Health and Nutrition

The anthropometry results indicate significant nutritional challenges for women ages 15-49 (reproductive age) in the survey population. While these women appear to be consuming sufficient or even excessive calories, their heights show that during childhood and adolescence their nutritional intake was insufficient. More than half (52 percent) of these women are short in stature (less than 145 cm). Similar results were found in the 2008-2009 ENSMI where 42.6 percent of non-pregnant women of reproductive age from households with children under five years of age in the Western Highlands are short in stature.³

The majority (62 percent) of women ages 15-49 in the survey population have a BMI within the normal range, with greater rates in CRS program areas (64 percent) than in SC areas (59 percent). The mean BMI for these women is 24.3, which is very similar to the BMI of 24.9 reported in the ENSMI survey. Only 2 percent of the women surveyed are underweight, but more than one-third (36 percent) are overweight or obese. Similar rates were found in the ENSMI survey, with 1.6 percent of the women surveyed being underweight and 32.5 percent being overweight.⁴

The household survey shows that women consume, on average, 3.9 of the nine basic food groups. Almost all consumed grains, roots, and tubers (99 percent), while only around half consumed fruits and vegetables (54 percent), green leafy vitamin A-rich vegetables (52 percent), and legumes and nuts (52 percent). The focus on grains, roots, and tubers over all other food groups likely contributes to the significant portion of overweight women and may contribute to poor health.

The most common illnesses identified during qualitative data collection were stomachache, cough, cold, fever, and parasites. Many respondents indicated that the first line of treatment is self-medication with natural remedies or purchased medicines, followed by treatment at a health center, then treatment at a hospital. Respondents interviewed in the qualitative study frequently cited cost as a limitation to effective treatment and noted that when they access the options that are free or more affordable, such as health centers, providers are often not adequately equipped to address their medical needs. Respondents also reported the lack of health services available locally as a challenge.

Mothers of children under five years of age generally lack sufficient knowledge of the signs of danger during pregnancy, during the neonatal period, and during early childhood although more than two thirds of these mothers seek health care when one of the identified danger signs is present. Mothers tend to seek treatment more during the neonatal and early childhood phases than during pregnancy. Almost all mothers (97 percent) make decisions about healthcare for their children (alone or jointly with their partners) while just 63 percent make decisions about health care for themselves (alone or jointly).

³ Chaparro, Camila. 2012. *Household Food Insecurity and Nutritional Status of Women of Reproductive Age and Children under 5 Years of Age in Five Departments of the Western Highlands of Guatemala: An Analysis of Data from the National Maternal-Infant Health Survey 2008–09 of Guatemala*. Washington, DC: FHI 360/FANTA-2 Bridge.

⁴ Ibid.

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Children's Health and Nutrition

The number of underweight and stunted children under five years of age is very high in both SC and CRS program areas. Lack of appropriate nutrition during childhood can have lifelong negative effects for these children in terms of physical health, mental acuity, and economic productivity. More than three-quarters of children (77 percent) under five years of age in the survey show signs of moderate and severe stunting, with greater rates in CRS program areas (80 percent) than in SC program areas (75 percent). UNICEF statistics for the entire country show a stunting rate of 48 percent in children under five years of age⁵ and the ENSMI survey shows a stunting rate of 62.5 percent in children under five years of age in the Western Highlands⁶.

Thirty-one percent of children under five years of age show signs of being moderately or severely underweight, with greater rates in CRS program areas (35 percent) than in SC program areas (26 percent). UNICEF statistics show a 13 percent rate for underweight children under age five years of age in the entire country⁷ and the ENSMI survey shows an 18.7 percent rate for children under five years of age in the Western Highlands of Guatemala⁸.

Respondents in the qualitative focus groups and interviews stated that the causes of malnutrition included poverty, lack of work or employment opportunities, poor hygiene, lack of a or limited food supply, no vitamins, improper nutrition, lack of breast milk, poor health of the mother, and limited knowledge of parental responsibility.

More than half of children (66 percent) under six months of age are exclusively breastfed according to the household survey, but only 20 percent of children 6-23 months receive a minimum acceptable diet (MAD). Focus group and interview respondents emphasized the importance of breastfeeding, and many noted that they received training on the subject. Generally, they noted that information about breastfeeding practices usually comes from parents, other family members, or health centers. Decisions about breastfeeding are made primarily by the woman or jointly with her partner.

The household survey found that 37 percent of children under five years of age in the program area had diarrhea in the two weeks preceding the survey, and 11 percent of this subset had blood in their stools. Caretakers seek advice or treatment for a majority of children with diarrhea (72 percent), and oral rehydration therapy (ORT) is used to treat half of children with diarrhea.

Conclusions

The household survey and qualitative data identify several areas that Title II programs might consider targeting. Dietary diversity for all household members appears to be lacking, particularly for woman ages 15-49 and children under five years of age. Poor dietary diversity can significantly impact the health of the survey population as evident in the high rates of stunting and underweight for children under five years of age and the high rates of overweight and obesity in women 15-49. Poor hygiene practices are another area for programs to target since these practices also significantly contribute to morbidity and mortality in the survey population as evidenced by the high rates of diarrhea in children under five years of age. Farmers report the need for more technical assistance to improve their agricultural practices and financial assistance to purchase products needed to improve yields. High poverty levels which are likely due to lack of employment opportunities and the inability of farmers to generate income from farming greatly influence all of these areas.

⁵ UNICEF. (n.d.) *At A Glance: Guatemala*. Retrieved from http://www.unicef.org/infobycountry/guatemala_statistics.html

⁶ Chaparro, Camila. 2012.

⁷ Ibid.

⁸ Chaparro, Camila. 2012.

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1. Introduction

In Fiscal Year 2012, the U.S. Agency for International Development (USAID) Office of Food for Peace (FFP) awarded funding to private voluntary organizations (PVOs) to implement multi-year Title II development food assistance programs in the most food-insecure regions of Guatemala. FFP issued two awards: one to Catholic Relief Services' (CRS) Seguridad Alimentaria Enfocada en los Primeros 1,000 Días (SEGAMIL) program in San Marcos and Totonicapán departments; and the second to Save the Children's (SC) Programa de Acciones Integradas de Seguridad Alimentaria y Nutricional del Occidente (PAISANO) program in Quiché, Huehuetenango, and Quetzaltenango departments. The main purpose of these Title II programs is to improve long-term food security in the Western Highlands.

The strategic objectives of the SEGAMIL program are to strengthen small-scale agricultural production and enhance farm and non-farm income to improve food availability and access; to strengthen linkages with government and local health services to improve the health and nutrition status of mothers and children under two years old; and to strengthen the early warning institutional capacity at the community and municipal levels for food security and emergency response. Project activities include, for example, training farmers in improved crop production techniques, creating micro-watershed communities, facilitating savings and lending groups, establishing peer-learning groups to promote nutrition-related behavior change, providing food rations, and establishing municipal-level early warning systems to detect increasing food insecurity. The project is expected to reach 23,500 direct beneficiary families.

The strategic objectives of the PAISANO program are to increase the economic productivity of rural households, reduce the chronic malnutrition among pregnant and lactating women and children under five years of age, and increase community resilience. Project activities include, for example, training community extension workers, increasing farming inputs, increasing access to financial services, improving farmer group production, providing conditional food rations, and developing nutrition schools. The project is expected to reach 26,517 direct beneficiary households.

In line with the USAID Evaluation Policy, FFP contracted with ICF International (ICF) to carry out a baseline study in a sample of communities where CRS and SC will implement these programs (see Annex 10 for the Contract Scope of Work). This baseline study is the first phase of a pre-post evaluation survey cycle. The second phase will include a final survey conducted in five years when the Title II programs are completed. The baseline study includes two components: (1) a representative population-based household survey to collect data for key FFP and program-specific indicators; and (2) a qualitative component to gather additional data that adds context, richness, and depth to understand the results from the household survey. The results from the baseline study will be used for the following purposes:

1. Establish baseline values of key FFP and program-specific indicators prior to implementation of the Title II programs;
2. Assist the PVOs in establishing target levels for improvements in these indicators over the five-year Title II program cycle;
3. Inform PVOs about the current food security situation so they can refine their program design and implementation strategies and improve efficiency by targeting the areas and subgroups that will benefit most; and
4. Provide FFP baseline indicator values that can be compared across countries through meta-analyses of the indicator results.

FFP defines food security as "all people at all times hav[ing] both physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life." Food security depends on four main factors: availability of food, access to food, utilization of food, and stability. Availability of food refers to the physical presence of food in the region, whether in markets, on farms, or through food assistance. Access to food refers to the ability of households to procure a sufficient quality and quantity of food. Utilization of food refers to the ability of individuals to properly absorb and select nutritious food. Stability in this context is the capacity to sustain acceptable nutrition over time.

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The baseline study of Title II development food assistance programs in Guatemala is designed to provide information on all four aspects of food security. The study investigates household food access, sanitation and hygiene, agriculture, household expenditures and assets, and health and nutrition among women and children.

This report begins with an overview of the methods for the population-based household survey and the qualitative study, followed by a summary of the food security situation in the Western Highlands. The findings from the household survey are then presented for all FFP and program-specific indicators. The qualitative study results are integrated with these findings to provide further context and understanding. The report closes with key findings and conclusions.

2. Methodology

2.1 Methods for Population-based Household Survey

A. Study Design and Objectives

The primary objective of the population-based household survey is to assess the status of key FFP and program indicators prior to program implementation. The baseline measurements will be used to calculate change in these indicators and to undertake a statistical test of differences in the indicators at completion of the Title II program cycle, when the same survey will be conducted again in the program areas. This pre-post design will enable the measurement of changes in indicators between the baseline and final evaluation, but will not allow statements about attribution or causation to be made.

B. Sample Design

The sample for the population-based household survey was selected using a multi-stage clustered sampling approach to provide a statistically representative sample of the beneficiary communities selected by each PVO, respectively, in their designated geographic regions of operation. For CRS, these communities are located in the departments of San Marcos and Totonicapán. For SC, these communities are located in the departments of Quiché, Huehuetenango, and Quetzaltenango.

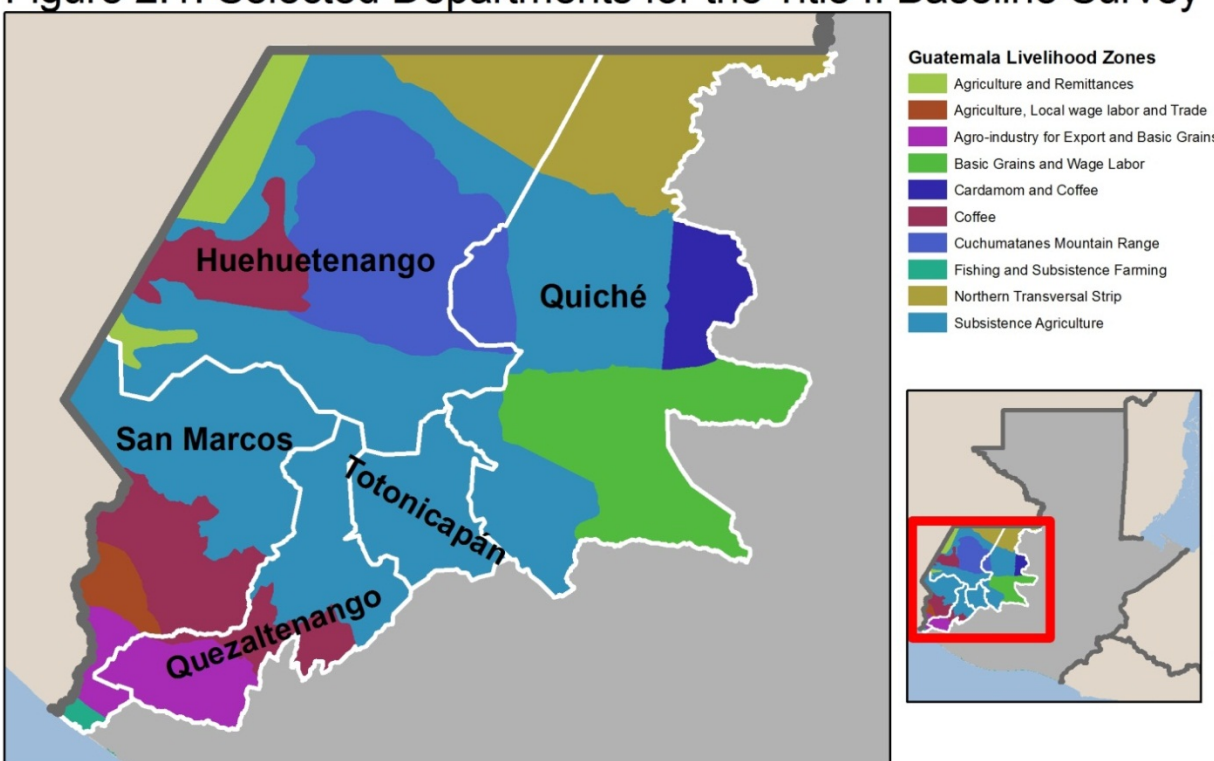
The sample allocations for each program were based on adequately powering a test of differences in the prevalence of stunting because stunting is a key measure for food insecurity. The sample size derived using the stunting indicator provides enough households to measure target change levels for all other indicators except the exclusive breastfeeding indicator for children ages 0-5 months and the minimum acceptable diet (MAD) indicator for children ages 6-23 months. The following criteria were used for deriving sample sizes for each Title II program:

- design effect (DEFF) of 2;
- confidence level of 95 percent;
- power level of 80 percent;
- expected change in stunting, over the life of the program, of 6 percentage points;
- use of the Stukel/Deitchler Inflation and Deflation Factors (see Appendix A of the FANTA Sampling Guide⁹) to determine the number of households (with children ages 0-59 months); and
- inflation of the sample size of households by 10 percent to account for household non-response.

Based on these criteria, the optimum sampling allocation was determined to be 75 communities, with 40 households per community for each program. The household sample size was 3,000 per program, or 6,000 households overall. A more detailed description of the sampling methodology can be found in the Sampling Plan for Baseline Studies of Title II Development Food Assistance Programs (see Annex 1). An overview of the sample selection procedures is provided below.

⁹ FANTA III Sampling Guide (1999) and Addendum (2012). Retrieved from <http://www.fanta-project.org/monitoring-and-evaluation/sampling>

Figure 2.1. Selected Departments for the Title II Baseline Survey



The sampling frame for each program was constructed from the set of communities selected for implementation by the PVOs. The PVOs provided community lists, which were matched to census-level household and population information in order to assign a measure of size for each community. Census-level household counts for communities in Guatemala were obtained from the 2002 Census, conducted by the Instituto Nacional de Estadística (INE). Since the last Census was conducted in 2002, some of the communities in the lists provided by the PVOs could not be matched to the Census file. For these communities, each PVO provided household counts.

The sample selection of 6,000 households was done in two stages: first, sampling of geographic clusters (or communities), and second, sampling of households within the communities. The first-stage sample of 75 communities for each program was selected using the sampling frame and an approximation to the PPS (probability proportional to size) sampling method. Table 2.1 provides the total program and sampled community and household counts for each program.

Table 2.1 Sampled Communities and Households for Each Title II Program

Department	Total communities in program	Total households in program	Total communities sampled	Total households sampled
SC PAISANO				
Huehuetenango	80	9,688	24	960
Quezaltenango	25	6,828	16	640
Quiché	93	14,641	35	1,400
Total	198	31,157	75	3,000
CRS SEGAMIL				
San Marcos	134	15,456	34	1,360
Totonicapán	125	18,701	41	1,640
Total	259	34,157	75	3,000

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Sampled communities were allocated proportional to the size of each department. Villages with less than 40 households, which accounted for 3 percent of all households, were removed from the sampling frame. Replacement communities were selected and used in instances where a community refused to participate. Replacements were made based on matching the department and sampling size stratum.

The second-stage selection of households was completed when the field teams entered each community. Prior to the second-stage sampling, the selected communities were canvassed on the ground in order to

- validate and/or update the household counts for each community;
- determine the appropriate sampling interval needed to obtain 40 households, using updated household counts;
- assess the density and placement of households within the community; and
- determine whether the community was large enough to divide into segments.

A systematic sampling approach was used to select households. This method entailed (1) randomly choosing a starting point between 1 and n (the sampling interval), with the household labeling 1, 2, ... n commencing at one end of the cluster; (2) conducting an interview in the first household represented by the random starting point; and (3) choosing every n th household from the previous one thereafter for an interview (where n is the sampling interval and equals the total number of households in the cluster, divided by 40), until the entire cluster has been covered. The field team supervisor was trained on how to implement the systematic sampling method before entering the field. Global positioning system (GPS) units were used to capture the longitude and latitude at the center of each community. Households in which no survey was conducted due to absence or refusals after three attempts were not replaced; therefore, the target of 40 households per cluster was not always achieved. The total number of households with completed interviews for each program is provided in the Findings, Section 4.1.

A third stage of sampling was done at the individual level to select one woman in households where multiple women were eligible to be interviewed for questionnaire Modules E (women's health and nutrition) and I (mother's health care awareness and decision making). For Module E, all women of reproductive age (15-49) were eligible and for Module I, all mothers of children ages 0-59 months were eligible. A Kish grid was used to randomly select the woman to be interviewed. All children under five years old were interviewed for the children's module. For Module G (agricultural practices), the primary farmer (first farmer identified on the roster who was usually the head of household) was first interviewed. When the farmer being interviewed did not have decision-making responsibility over an area in the questionnaire (for example, raising animals), a second farmer was interviewed who could provide answers for that part of the module. Further details of sampling at the individual level are provided in the Sampling Plan for Baseline Studies of Title II Development Food Assistance Programs (Annex 1).

C. Questionnaire

The survey questionnaire (see Annex 2) was developed through a series of consultations with FFP, the Food and Nutrition Technical Assistance III Project (FANTA), and the PVOs before, during, and after the in-country workshop in December 2012. During the workshop, ICF and the PVOs shared information about the baseline study and Title II programs and worked on finalizing the survey questionnaire.

A preliminary questionnaire was developed prior to the workshop, based on the selected FFP indicators and the guidelines described in the *FFP Standard Indicators Handbook*.¹⁰ Definitions for sustainable agricultural practices, value chain activities, and improved storage practices were confirmed with the PVOs during the workshop, along with definitions for the program-specific indicators to be included in the questionnaire. Other questions that required adaptation to the local country context, such as foods and

¹⁰ USAID. (2011). *FFP Standard Indicators Handbook (Baseline-Final Indicators)*. Retrieved from http://pdf.usaid.gov/pdf_docs/pnadz580.pdf

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types of sanitation facilities, were also defined in consultation with the PVOs, the USAID mission in Guatemala, FFP, and FANTA.

The questionnaire consisted of separate modules for the following topics:

- Module A: Household identification and informed consent
- Module B: Household roster
- Module C: Household food diversity and hunger
- Module D: Children's nutrition and health
- Module E: Women's nutrition and health
- Module F: Household sanitation practices
- Module G: Agricultural practices
- Module H: Household consumption
- Module I: Mother's health care awareness and decision making
- Anthropometry

Questions for Modules A through G were adapted using questions from the *FFP Standard Indicators Handbook* and the Demographic and Health Survey (DHS) questionnaire¹¹. Questions for Module H were adapted from the Guatemala Encuesta Nacional de Condiciones de Vida (ENCOVI) survey, conducted by Instituto Nacional de Estadística (INE) in 2011. After discussions during the initial workshop, the PVOs provided questions for Module I.

D. Field Procedures

a. Training, Piloting, and Pre-testing

For training and fielding purposes, ICF developed three separate training manuals based on FFP and DHS guidelines:

1. **Supervisor Manual** – includes a number of topics required to effectively prepare supervisors and field editors for fieldwork, such as introduction and objectives of the study, survey organization, team leader roles and responsibilities, rules and regulations, ethics, fieldwork preparations, and quality control requirements/procedures.
2. **Interviewer Manual** – includes guidelines for implementation of the survey and fieldwork procedures including interviewing techniques and procedures for completing the questionnaires. This manual also included detailed explanations and instructions for each question.
3. **Anthropometry Manual** – includes procedures adapted from the DHS biomarker manual for all of its surveys worldwide. The procedures in the DHS biomarker manual were adapted from *How to Weigh and Measure Children*¹² and approved by FFP for use in this survey.

Supervisor training was held in Quetzaltenango from January 14-20, 2013. The field director and coordinators from the Guatemalan subcontractor Aragon y Asociados and field managers from ICF led the supervisor training. PVO representatives from SC and CRS observed the training and provided input. The training covered supervisor roles and responsibilities, rules, behaviors and ethics, household and respondent selection, use of the field control sheet, maps and segmentation, GPS data collection, and a detailed review of the household survey questionnaire with group practices and mock interviews/role playing. The training also included a review of the methodology for callbacks and field editing. Subject matter experts on agriculture and nutrition supported the training and provided input on local agricultural practices and nutrition in the Guatemalan context.

¹¹ DHS Model Questionnaire – Phase 6 (2008-2013) (English, French)/ Retrieved from <http://www.measuredhs.com/publications/publication-dhsq6-dhs-questionnaires-and-manuals.cfm>

¹² I.J. Shorr. *How to Weigh and Measure Children*. UN: New York. 1986. Modified in 1998.

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Interviewer training took place in Quetzaltenango from January 28 to February 9, 2013. The training covered interviewers' roles and responsibilities, rules, behaviors and ethics, respondent selection, and detailed review of the household questionnaire with group practices and mock interviews/role playing. The agriculture and nutrition subject matter experts who assisted with the supervisor training also participated and provided input on local agricultural practices and nutrition in the Guatemalan context. Aragón y Asociados field directors and coordinators, as well as ICF field managers, led the interviewer training. Trained supervisors also participated by providing input and leading exercises during practice sessions.

Due to delays in the start of fieldwork, all field coordinators, supervisors, and interviewers attended a week-long refresher training course in Quetzaltenango from March 18-23, 2013.

Anthropometry training was conducted concurrently with the interviewer training in the training facility and at child care centers in Quetzaltenango. Twenty-one health professionals were trained as anthropometrists by ICF expert Irwin Shorr and his Guatemalan counterpart/assistant. All interviewers were also trained to serve as anthropometry assistants during this 6-day training.

Anthropometry standardization took place at a training facility and at child care centers in Guatemala City from March 11-23, 2013. It started with reviews of anthropometry procedures, followed by implementation of anthropometry standardization. Independent replicate measures of 10 subjects were taken by all anthropometrists and supervisors for each of the following standardization tests:

- Maternal height
- Maternal weight
- Standing height of children 2-5 years of age
- Weight of children 2-5 years of age
- Recumbent length of children under two years of age
- Weight of children under two years of age

All anthropometry team members—one lead anthropometry supervisor, seven anthropometry supervisors, and 21 anthropometrists—passed the standardization tests.

Immediately following the supervisor training, supervisors piloted the questionnaire in eight communities selected by the PVOs in each of the five departments on January 22-23, 2013. The PVOs, SC, and CRS observed the pilot interviews and provided feedback. The purpose of piloting was to test the soundness of the questionnaire and to identify potential problem areas, such as skip patterns, wording, sequence of questions, clarity of the questionnaires in terms of both coding and instructions to interviewers, and whether any of the questions were particularly difficult or sensitive. After piloting was completed, a debriefing session was held with the supervisors to discuss and address difficulties or problems with the interviews. Based on the pilot results, ICF revised the questionnaire and forwarded it to USAID for final approval before the start of interviewer training.

Following the interviewer and anthropometry trainings, the pre-tests were conducted on February 11 and 12, 2013, with each of the 21 field teams located in 12 communities throughout each of the five departments. The purpose of the pre-tests was to observe all interview team members' to ensure preparedness, appropriate contact strategy, familiarity with the questionnaires outside the classroom, and an understanding of the household sampling process. SC and CRS also observed the pre-tests and provided feedback. A debriefing session was held with coordinators, supervisors, interviewers, and anthropometrists to discuss their pre-testing experiences and to identify and address problems with preparedness, field procedures, or contact strategy.

b. Fieldwork

The Title II data collection team members in Guatemala included one field director, five regional coordinators (one assigned to each of the five departments), 21 supervisors, 84 interviewers, one lead anthropometry supervisor, seven regional anthropometry supervisors, and 21 anthropometrists. There

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were 21 field teams. Each team consisted of one supervisor, four interviewers, and one anthropometrist. In each team, a supervisor and one selected interviewer conducted field editing of the questionnaire. The baseline survey was conducted in five languages: Ixil, Quiché, Mam, Popti, and Spanish. Interviewers with appropriate local language skills were assigned to the communities where their native indigenous languages were spoken.

Five ICF field managers rotated and oversaw the training and fieldwork in Guatemala. During critical periods, including training and re-training, anthropometry standardization, questionnaire, piloting, pre-tests, and beginning of fieldwork, two to three ICF managers were in-country at the same time to coordinate and supervise activities. ICF managers provided supervision during the entire fieldwork period. Collectively, they visited all interview teams in the five departments to observe the interviews; and to identify and correct mistakes, especially at the beginning of fieldwork; and to provide feedback and guidance for improvement.



Fieldwork in Guatemala lasted approximately 2.5 months (starting April 1 and ending June 15, 2013). As described in Section 2.1B, field supervisors were required to confirm/recount the number of households in each community before conducting the interviews. The updated household counts were reported to the ICF survey specialist, who determined appropriate sampling intervals and random start points.

ICF implemented additional anthropometry supervision by having seven anthropometry supervisors monitor anthropometry activities during fieldwork. Each supervisor supervised four to five anthropometrists in each department. The seven anthropometry supervisors reported to the overall anthropometry coordinator/lead supervisor during data collection. The lead supervisor regularly consulted the ICF anthropometry expert and field managers on all issues related to anthropometry during fieldwork.

For quality control purposes, supervisors were required to keep fieldwork control sheets to record contact with households and GPS data for each community. These sheets were used to record number of attempts to reach each household, number of households and individuals interviewed within each household, and reasons for non-response in households where interviews were not obtained.

Supervisors were required to conduct spot checks of at least 15 percent of all interviews. As a part of this quality control process, supervisors verified (1) the interview took place, (2) the approximate duration of the interview, (3) the information on the household roster was accurate, (4) the proper administration of the various sections of the questionnaires, and (5) interviewers' general adherence to professional standards. In addition, a supervisor and a selected interviewer in each team conducted field editing to review every completed questionnaire on the same day of data collection. Questionnaire editing was done to check for adequate completion of all fields, missing data, and legibility of open-ended items. Interviewers were required to make corrections or return for subsequent interview, if necessary.

c. Data Entry and Processing

After all survey forms for a community were cleared through the field quality control procedures, the forms were packaged and forwarded to the central data entry office in Guatemala City. A team of trained data entry personnel inputted data on the forms using proprietary software developed by Aragón y Asociados and customized to the survey form. ICF worked directly with the data entry teams to ensure that the data entry software was thoroughly tested and matched the survey form. ICF reviewed the data entry software to ensure that only valid data ranges were allowed for each question and that the program included checks for questionnaire logic (e.g., skips and filters) and flagged any data inconsistencies. ICF developed a common IBM SPSS Statistics database structure, which was forwarded to the in-country data processing team and was used to deliver all data to ICF.

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ICF conducted a quality control review of the raw data and converted SPSS data files after 100 survey forms were entered to ensure that the data were complete and accurate and to determine whether there were any problems with data conversion or the database structure. Appropriate feedback was provided, and changes to the data entry software or SPSS database were incorporated as needed.

For the final dataset, data cleaning took place locally, in-country, based on ICF's review of the final dataset. Checks were conducted for the following: village matching to sampled villages; household roster consistency with individuals interviewed for each module; duplicate records; data completeness (e.g., variables, labels, and missing data); data validity (e.g., frequency distribution anomalies and out-of-range values); and data consistency (e.g., correspondence between the number of interviews at each level, and skip patterns). Identified data inconsistencies were forwarded to the data teams for review and correction. Final data review and preparation for analysis took place at ICF after receipt of the cleaned dataset.

E. Data Analysis

a. Sampling weights

Sample weights were computed for each indicator corresponding to a unique sampling scheme. The sampling weight consists of the inverse of the product of the probabilities of selection from each of the stages of sampling (cluster selection; household selection; and, when relevant, individual selection). For Guatemala, separate weights were derived for the following:

- Households (used for indicators derived from Modules C, F, and H)
- Children (Module D)
- Women 15-49 years (Module E)
- Farmers (Module G)
- Mothers of children ages 0-59 months (Module I)

Weights were adjusted to compensate for household and individual non-response, as appropriate. Different sampling weights were calculated for separate analyses of each implementing partner area and for the Title II program area as a whole.

b. Indicator definitions and tabulations

FFP indicators were calculated using tabulation methods as currently documented in the *FFP Standard Indicators Handbook*. Table A3.1 in Annex 3 presents the specific definition and disaggregation for each indicator. Child stunting and underweight indicators are derived using the World Health Organization (WHO) Child Growth Standards and associated software.¹³ Consumption aggregates—to compute prevalence of poverty, mean depth of poverty, and per capita expenditure indicators—follow the World Bank's Living Standards Measurement Survey (LSMS)¹⁴ methodology (see Annex 4 for more detail).

The four FFP agricultural indicators were developed based on input from the PVOs, FANTA, and FFP. Agricultural activities, value chain activities, and storage practices were defined based on those activities and practices used and promoted by the PVOs. Table A3.2 of Annex 3 provides operational definitions of each indicator.

Program-specific indicators were selected and defined based on the objectives of the programs designed by the PVOs. These indicators were discussed during the December workshop and were finalized based on input from FFP, FANTA, and the PVOs. Table A3.3 of Annex 3 provides the selected program-specific indicators and their definitions.

Results for all indicators are weighted to represent the full target population and tabulated for the combined program areas and for each Title II program separately. Point estimates and variance

¹³ WHO. (2011). WHO Anthro and macros, version 3.2.2. Retrieved from <http://www.who.int/childgrowth/software/en/>

¹⁴ Living Standards Measurement Study (LSMS) surveys. Retrieved from www.worldbank.org/lsm

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estimation are derived using Taylor series expansion and take into account the design effect associated with the complex sampling design; 95 percent confidence intervals are provided for all FFP indicators at the country level and for each Title II program separately. A tabular summary of all indicators with confidence intervals for both program areas combined and separately is provided in Annex 7.

c. Handling of missing data and “Don’t Know” responses

Missing data points were excluded from both the denominator and the numerator for calculation of all FFP and program specific indicators. Coders recoded “Don’t Know” responses to the null value and included them in the denominator. For example, for the household dietary diversity component, “Yes”, “No” and “Don’t Know” responses were included in the denominator, but only “Yes” responses were counted in the numerator. The number of “Don’t Know” responses was in any case small, (e.g., in the case of the HDDS indicator, the maximum number of “Don’t Know” responses for any food group was 4 cases, which is equivalent to less than 0.1 percent of the total sample).

For anthropometry indicators, the WHO software flagged biologically implausible cases according to WHO criteria,¹⁵ and only those children with valid weight and height scores were included in the analysis for the stunting and underweight indicators. Implausible cases were excluded from the analysis, but were left in the dataset.

d. Descriptive cross-tabulations

Further descriptive analyses were conducted to provide additional context and present the subcomponents underlying some key indicators. These descriptive analyses include the following:

- Characteristics of households: household size, household headship, education level of head of household, gendered household type, percentage of households with children under five years of age and with a child 6-23 months;
- Food groups consumed for Household Dietary Diversity and Women’s Dietary Diversity;
- Sanitation practices: drinking water sources, treatment of drinking water, and toilet facilities;
- Prevalence of stunted and underweight children under five years of age, by age group;
- Breastfeeding status for children under two years, by age group;
- Components of a minimum acceptable diet (MAD) for children 6-23 months;
- Percentage of women 15-49 years old by Body Mass Index (BMI) and height groupings;
- Percentage of farmers by value chain activity performed in the past 12 months;
- Percentage of farmers by sustainable agricultural practice used in the past 12 months; and
- Percentage of farmers by storage practice used in the past 12 months.

e. Multivariate Models

Multivariate analyses were performed to deepen PVOs’ understanding of the causes of food insecurity and malnutrition. These analyses were adjusted to take the design effect into account and were conducted separately for each program and overall. Multivariate analyses focused on two critical indicators:

- Household Hunger Scale (HHS)—moderate or severe hunger as a critical food insecurity indicator
- Prevalence of stunted children under five years of age—height-for-age Z-score (HAZ) as a critical malnutrition indicator

For household hunger (a binary indicator), a logistic regression approach was used. For the HAZ (a continuous indicator), an ordinary least squares (OLS) regression approach was used.

¹⁵ WHO Multicentre Growth Reference Study Group. WHO Child Growth Standards: Length/height-for-age, weight-for-age, weight-for-length, weight-for-height and body mass index-for-age: Methods and development. Geneva: World Health Organization, 2006 (312 pages).

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For each of these outcomes, independent variables were identified separately. The variables were selected based on the availability of variables from the survey data and their theoretical relevance as predictors; this relevance was established by reviewing previous models and discussions with the PVOs, FFP and FANTA. Independent variables included in each model are presented in sections 4.2.A.1 and 4.5.A.1, with the full models presented in Annex 8. It is worth noting that these models are exploratory rather than causal, and that the possibility of unobserved variable bias cannot be ruled out.

2.2 Methods for Qualitative Study

A. Study Design and Objectives

The overarching objective of the qualitative component of the baseline study is to elucidate and contextualize the findings from the population-based household survey. Specifically, the qualitative component aims to uncover patterns in decision-making and access to health care and food/beverages at the family and villages levels, and to help researchers understand the “how” and “why” of food utilization and consumption, as well as the access and uptake of health care. For example, the household survey provides information about foods and beverages the household uses, consumes, or produces; and health care the household accesses, uses, or consumes. Qualitative data provide insight into who makes the decisions regarding food/beverage usage, consumption, and production, as well as decisions regarding health care use and/or consumption, what the decision-making process is, and how other factors (such as demographic characteristics, culture, or socio-historical context) may affect the decision-making process.

To supplement the household survey findings, ICF aimed to meet seven intermediate analytic goals:

1. Describe access to and use of food and beverages at the household and village levels, especially access and use for women and children under five years of age.
2. Describe the decision-making process used for food and beverage consumption at the household and village levels, especially as it affects women and children under five years of age.
3. Describe patterns in the health care needs of households and villages, and the access to and type of care available to household and village members, emphasizing the needs of women and children under five years of age.
4. Describe how decisions are made regarding health care at the household and village levels, especially for women and children under five years of age.
5. Describe patterns in agricultural development and processes at the household and village levels for farming for subsistence and income generation.
6. Describe the living conditions and economic practices of potential program participants.
7. Describe any cultural, political, environmental, or other social contexts that may influence decision making and access to food and health care.

To meet these objectives, a qualitative research team undertook a field study of a sample of communities where CRS’ SEGAMIL and SCs’ PAISANO are implementing their programs. The field study consisted of three components. First, the qualitative team met with staff from the PVOs and from the survey team to identify key areas that needed more in-depth exploration. Second, as described below, the team visited eight communities in five departments, where they undertook both in-depth interviews (IDIs) and focus group discussions (FGDs) with a sample of individuals. Finally, the team conducted formal interviews with key informants (KIs) who had insights into health and nutrition as well as livelihood development in the communities where the SEGAMIL and PAISANO programs are taking place.

B. Study Sample

The household survey was conducted at the household level with four primary respondent groups: the head of household or responsible adult, women ages 15-49, primary caregiver or mother of children ages 0-5 years, and farmers. These groups were also the primary focus of the qualitative data collection. Specifically, the qualitative team interviewed two categories of individuals: KIs and potential direct beneficiaries (PDBs). PDBs are individuals who may participate in the program once the programs roll out their respective projects. KIs are individuals who, due to their position, have important information

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regarding the communities in the Title II program areas or the programs themselves. In this study, the qualitative team worked with the following six categories of respondents who were PDBs:

- Male head of household: A man who self-identifies or is identified by another household member as head of household and has decision-making authority. This individual may or may not have children, may or may not have a single or multiple spouses, and may or may not participate in farming activities. The preference is to speak with individuals who have children under five years of age in the household, though this is not a requirement.
- Female head of household or lead female in household: A woman who self-identifies or is identified by another household member as a lead female figure in a household and has some decision-making authority. The individual may or may not have children, may or may not live with her husband or a male head of household, and may or may not participate in farming activities. The preference is to speak with individuals who have children under five years of age in the household, though this is not a requirement.
- Male farmer: Using the standard FFP definition of farmer¹⁶ established in the baseline survey, a male who undertakes and has decision-making authority over farming activities either on his own property or on someone else's (community plot). The type of farming the individual undertakes is open. He may participate in the care of animals, preparation of fields, tending to and harvesting crops, or the processing of food stuffs. He may participate in farming either for subsistence or income generation, or both.
- Female farmer: Using the definition of farmer indicated above, a female who undertakes and has decision-making authority over farming activities on her own property or someone else's (community plot). The type of farming the individual undertakes is open. She may participate in the care of animals, preparation of fields, tending to and harvesting crops, or the processing of food stuffs. She may participate in farming either for subsistence or for income generation, or both.
- Male caregiver or father: A male in the household who either cares for children in the household or is a father of children under five years of age. He should have knowledge of the child's feeding and eating patterns and health care needs and consumption. This individual may or may not be a head of household and may or may not farm. It is not important or relevant for this individual to be a farmer.
- Female caregiver or mother: A female in the household who either cares for children in the household or who is a mother of children under five years of age. She should have knowledge of the child's feeding and eating patterns and health care needs and consumption. This person may or may not have a spouse living in the household. It is not important or relevant for this individual to be a farmer.

The KIs included representatives from the PVOs and their partners, community or department health and/or nutrition experts, and community or department livelihood or agricultural development experts.

For the qualitative study component, the sampling strategy was purposive. That is, ICF and the team targeted communities and individuals based on a set of criteria in order to meet the overall objective of

¹⁶ FFP definition of a farmer: Farmers include (1) herders and fishers and are men and women who have access to a plot of land (even if very small) over which they make decisions about what will be grown, how it will be grown, and how to dispose of the harvest; AND/OR (2) men and women who have animals and/or aquaculture products over which they have decision-making power. Farmers produce food, feed, and fiber, where "food" includes agronomic crops (crops grown in large scale, such as grains), horticulture crops (vegetables, fruit, nuts, berries, and herbs), animal and aquaculture products, as well as natural products (e.g., nontimber forest products, wild fisheries). These farmers may engage in processing and marketing food, feed, and fiber and may reside in settled communities, mobile pastoralist communities, or refugee/internally displaced person camps.

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the qualitative component. Three main criteria were used to select the sample: category of individual, geographic region, population size (to denote access to services), and strategic objectives of the PVOs. Annex 5 provides a table showing the department, municipality, community, estimated number of households, data collection activity undertaken, and the PVO responsible for each community visited.

C. Instruments

Prior experience in conducting the qualitative interviews demonstrated that community members were able to answer not only specialized questions for their topic area, but questions in all topic areas, because their roles and responsibilities at the household level often crossed over, such that a male head of household often is also a farmer, or a female household lead is also a mother. Therefore, ICF reduced the number of question guides used for the FGDs and IDIs in Guatemala to five, as follows:

- IDI guide for PDBs;
- FGD guide for PDBs;
- IDI guide for PVO reps;
- IDI guide for business and agriculture development expert; and
- IDI guide for health and nutrition expert.

The English and Spanish versions of these question guides are included in Annex 6.

Two priorities were set in the development of these question guides. The first priority was to meet the objective of the qualitative research; that is, to help researchers understand findings from the household survey. The team did this by ensuring that the topic areas covered in the qualitative question guides mirrored those found in the household survey instruments. The topic areas include the following:

- Background information
 - Description of household
 - Description of individual's role in household
- Food access and utilization
- Nutritional status of women and children
- Health status, access to health care, and health care consumption
- Water, sanitation, and hygiene
- Agricultural practices and production
- Livelihood
 - Agricultural sources of income
 - Other income sources
 - Savings and expenditures
- Socio-cultural community context
- Program implementation, strategies, and goals

The second priority was to work with the survey team from Guatemala and identify potential gaps or topic areas that required additional information. The following topic areas were added based on the team's preliminary observations of data collected through the survey:

- Sanitation: explore type of facility and awareness around latrine use
- Agricultural production
 - Decision making: types of foods produced
 - Storage: practices and strategies
 - Marketing: practices as well as access and opportunities
 - Financial services: Saving practices and insurance
 - Response to crisis
- Dietary habits: decision making around food choice/selection
- Infant and young child feeding practices
 - Breastfeeding (initiation, duration, predominant or not)

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- Introduction of solid, semi-solid or soft foods
 - Dietary diversity for young children (under two years)
- Diarrhea: data indicate a high prevalence of diarrhea among children under five years of age
 - Diarrhea knowledge
 - Local treatment practices
 - Difficulties accessing treatment or health professionals
- Gender, decision-making roles and responsibilities
- Migration
- School attendance: balancing agricultural work with schooling/education

The interview and focus group guides were first prepared in English; the next draft was first completed in English and then translated into Spanish. FFP and FANTA reviewed the English draft, and CRS and SC reviewed the Spanish draft. Upon receipt of feedback from FFP, FANTA, and the PVOs, a final version was completed. ICF used the Spanish version to train the data collection staff from the local subcontractor, El Instituto de Estudios Interétnicos (IDEI). Based on experience from the household survey data collection, the interviewers worked from the Spanish guides, even with interviews conducted in the local Mayan languages Mam and Quiché.

D. Data Collection

Data collection occurred in the following eight communities in five departments:

1. Totonicapán: Chiusuc Centro
2. Totonicapán: Paraje Pajomet
3. Quiché: Chugüexa I
4. Quiché: Ojo de Agua Camino Real
5. Quetzaltenango: Varsovia
6. Huehuetenango: Magdalena Chancol
7. San Marcos: San Francisco
8. San Marcos: Cerro Grande

Two teams were involved in the qualitative data collection: a recruitment team and a data collection team. The recruitment team traveled two days prior to the data collection team to gain access to the community and identify participants that met the selection criteria. Ultimately, six FGDs and 24 IDIs with potential direct beneficiaries and eight IDIs with KIs were conducted. PDB interviews were conducted by individual representatives from IDEI in the local language or in Spanish, and the interviews were overseen by the ICF Qualitative Research Lead, who is fluent in Spanish. The same ICF Qualitative Research Lead, with the assistance of an interpreter, oversaw the interviews that took place in the Mayan languages. As described above, one primary guide was used for all of the IDIs and a second was used for the FGDs with PDBs. Each IDI with PDBs lasted approximately one and a half hours, and each FGD with PDBs lasted between one and a half to two hours. On average, the IDIs and informal conversations with KIs lasted between one and a half to two hours. All of the IDIs and FGDs were digitally recorded. A senior researcher took field notes during the interviews and FGDs to accompany the transcripts from the recordings.

E. Data Preparation, Coding, and Analysis

Prior to the completion of the data collection, the local subcontractor began transcribing and translating the IDIs and FGDs that were digitally recorded. ICF conducted periodic quality assurance checks to ensure that the transcripts aligned with observations of interviews. Some challenges with transcription were encountered due to conducting the interviews outdoors, which caused difficulties hearing the recordings. For the few portions of the interviews that were inaudible, analysts relied on field notes to supplement analysis. Once the transcription was completed, an individual from the coding team developed a codebook in collaboration with an individual from the data collection team, drawing from the IDI and FGD protocols, experience in the field, and the structure of the final report. The data were coded

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using ATLAS.ti. To check for reliability at the front end of coding, two coders coded the same transcript simultaneously and re-coded until they reached consensus. The lead coder then reviewed the coding to ensure consistency. The coded qualitative data were analyzed using both content and domain analyses. Content analysis was used to identify themes or trends in responses, both within and across respondent groups, so that the findings from the household survey could be triangulated with the findings from the qualitative data collection. For example, content analysis identified which foods individuals consumed and whether those identified through the qualitative component of the study aligned with those from the household survey. Domain analysis examined the possible relationship between responses and the socio-cultural context of the communities in which the program was being implemented. Drawing from the previous example, domain analyses was undertaken to understand the context in which choices about food consumption were made and the possible influence that particular contextual factors may have on the decision-making process. The purpose of this report is to assess the qualitative trends in relationship to the household survey findings, and to better understand the quantitative indicators through an examination of context. Specifically, the qualitative analysis examines the following issues: migration, women's rights, drivers and decision making around consumption, poverty and livelihoods, sanitation, agricultural development, community-level health issues, and health and nutrition in women and children.

2.3 Study Limitations and Issues Encountered

Limitations and issues encountered during the baseline study of Title II development food assistance programs in Guatemala are summarized below.

Compressed timeline for fielding the surveys

Baselines are critical to the overall Title II program evaluation cycle and must measure key attributes of the target population prior to the start of program implementation. This requirement resulted in considerable pressure to field the baseline data collection as soon as possible so as not to delay the start of program implementation. Within a very limited time frame, the ICF research team developed the technical approach to the baseline study and created survey instruments, procedural manuals, and field guides. Because it was the first time FFP contracted with an outside firm to conduct an independent baseline study of Title II programs, many elements of the project had to be developed for the first time. Future FFP-managed baseline and endline surveys will benefit from the preparative work accomplished during this early stage.

Qualitative study designed concurrently with population-based household survey

Due to the short timeline for the overall study, it was not possible to undertake the qualitative study after the household survey was completed, so the surveys were conducted concurrently. There were consequences in having the components occur simultaneously. First, the qualitative research team was unable to draw from the household survey findings to inform the study design. Consequently, the instruments, sampling, and overall approach were designed prior to the household survey data collection. Second, so as not to miss particular topic areas, the qualitative team covered a broad range of topics but could have covered the fewer topics in greater depth had the household survey results been available. Third, the qualitative team emphasized data collection at the household level with single individuals rather than at the key informant level so that data could be triangulated with data collected by the household survey teams. The number of communities visited and interviews conducted were limited, which constrained researchers' ability to identify contextual differences across communities. While in most cases the data collected are useful in exemplifying the findings from the household survey, further qualitative information could have helped to explain specific household survey results.

Outdated household counts and maps

The quantitative research team did not originally plan to conduct a household listing exercise in sampled communities. However, a listing exercise was necessary because census counts were outdated. The need for verification of household counts led to complications, in terms of time and costs. ICF and Aragon y Asociados explored a variety of sources for maps. However, up-to-date maps were not always available

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for some communities. The teams spent a considerable amount of time making sure that the entire community was covered by checking with local informants, who sometimes provided contradictory information. The main consequence was that fieldwork in some large or vaguely delimited communities took longer than expected.

Recruitment and training challenges

To address cultural and language barriers, ICF recruited interviewers from the region and, when possible, from specific departments and municipalities. Recruiting a sufficient number of qualified interviewers for such a large-scale and complex study presented challenges not only for the household survey, but also for the qualitative data collection. Some interviewers were screened out during the training and fielding process. ICF spent significant time and resources to train and improve the capacity of the data collection team members to the level required. The capacity of the team members was the key to successful fieldwork implementation.

Logistics and transportation constraints

The research team experienced significant challenges due to the geography and road conditions in the Western Highlands. It takes hours to travel from one community to another. In addition, rainfall during the last month of fieldwork made the roads treacherous, and the teams experienced great difficulty in accessing certain communities.

Difficulty accessing communities

ICF experienced difficulties in obtaining support from local authorities, particularly in the departments of Totonicapán and Huehuetenango. Some community leaders had not yet been informed about the Title II programs. Additional difficulties were caused due to distrust and resistance in some communities stemming from the repression during the Civil War from the 1960s to 1996 and recent news about mining companies allegedly misleading community members into signing papers to turn over their lands to outsiders. Also, the delay due to the prolonged process of reaching an agreement on anthropometry procedures with the PVOs and USAID caused some communities to cancel their participation in the survey. When communities were not accessible or refused to participate, they were replaced with pre-identified back-up communities. However, the process of replacing communities took time and created logistical planning issues.

Difference in anthropometry standards

Significant delays in the fieldwork schedule were caused due to the time and resources needed to clarify the updated anthropometry standards which were not yet in use by health authorities in Guatemala. This effort required many meetings with the USAID/Guatemala Mission, FFP, and the PVOs. Additional anthropometry standardization training was conducted as part of the process in gaining approval of the updated procedures.

Length and complexity of the questionnaire

The length and complexity of the questionnaire made interviews difficult. Interviewers often needed to explain survey questions verbally. Respondents often were tired toward the end of the interview and needed extra coaxing in order to finish the interview. In addition, the survey required responses from multiple household members, which added to the time required to complete the questionnaire since interviewers often needed to wait or return to households later to interview appropriate respondents.

Confusion over eligibility criteria for children

On the household roster, eligible children are defined as “any child under six years of age.” However, the definition of children eligible for the children’s module is “those under five years of age.” Although the inclusion of children under six as eligible on the roster was intentional so as not to miss any children that might actually be less than five, this difference in definition between the roster and the children’s module created confusion for many of the field staff and interviewers. Field managers and supervisors continually

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explained and reinforced the difference between the roster requirements and the children's module verification of age under five years throughout the trainings and fieldwork.

Seasonality of data collection

In the Western Highlands, there is one primary season with an April/May planting that is harvested in November and December. The annual lean season starts in June and peaks in July and August. The household survey was intentionally conducted in April to June, during the start of the lean season, so as to measure indicators during the most vulnerable period for the beneficiary population. Although this is not a limitation, it will be important that endline data are also collected during the same time period since seasonal fluctuations influence indicators measuring food access, hunger, and dietary diversity.

Tight timeframe for analysis and reporting

The tight timeframe for data analysis and reporting did not allow sufficient time for the research team to thoroughly analyze and evaluate the wealth of data collected for the household survey. The quantitative analysis focused on development of the indicators, accompanied by supporting bivariate analyses. Little time was available to develop and explore further multivariate analyses. Additionally, much of the rich qualitative data that was collected could not be fully analyzed and included in the report.

3. Overview of the Food Security Situation in the Western Highlands of Guatemala

Guatemala has one of the highest rates of malnutrition in the world and has a long history of food security challenges. Nearly half of children under age 5 suffer from malnutrition.¹⁷ In particular, indigenous populations are more affected by malnutrition and poverty than other populations.¹⁸ According to data from the 2008-2009 National Maternal-Infant Health Survey of Guatemala (ENSMI), nearly three-fourths of households reported worrying about the amount of food in the household, and around two-thirds lacked adequate money to buy food over the month preceding the survey. The study found that just under half of women are short in stature and around the same percentage are either overweight or obese. More than half of children under age 5 are stunted, and around one-fifth are underweight.¹⁹ The most important contributing factors to food insecurity in the region are lack of access to food by the poor and limited utilization of food.²⁰

Many Mayan families depend on low-yield, small-scale agriculture with insufficient productivity to meet household needs. Land tenure policies as well as population growth have contributed to the increasingly smaller plot sizes in rural indigenous areas, with an average size of 0.5 to 2 hectares per household.²¹ Most land farmed by this population is hilly, with the most productive land in use by large export companies. Productivity is vulnerable to droughts since nearly all agriculture in this area is rain-fed.²²

In the Western Highlands there is one primary season, with an April/May planting that is harvested in November and December. The annual lean season starts in June and peaks in July and August. The most common crops cultivated in the Western Highlands are maize and beans.

¹⁷ World Food Programme. (n.d.). EU food facility fact sheet: Guatemala. Retrieved from <http://www.wfp.org/content/eu-food-facility-fact-sheet-guatemala>

¹⁸ U.S. Global Health Initiative. (n.d.). Global Health Initiative: Guatemala strategy. Retrieved from <http://www.ghi.gov/country/guatemala/documents/160169.htm>

¹⁹ Chaparro, C. (2012). Household food insecurity and nutritional status of women of reproductive age and children under 5 years of age in five departments of the Western Highlands of Guatemala: An analysis of data from the National Maternal-Infant Health Survey 2008-09 of Guatemala. Washington, DC: FHI 360/FANTA-2 Bridge.

²⁰ U.S. Government. (2011). Guatemala: FY 2011-2015 multi-year strategy. Retrieved from <http://www.feedthefuture.gov/sites/default/files/country/strategies/files/GuatemalaFeedtheFutureMultiYearStrategy.pdf>

²¹ USAID Office of Food for Peace. (2011). Guatemala Bellmon Estimation. Retrieved from http://pdf.usaid.gov/pdf_docs/PNADY391.pdf

²² FAO & WFP. (2010). Misión FAO/PMA de evaluación de cosecha y seguridad alimentaria en Guatemala. Retrieved from <http://documents.wfp.org/stellent/groups/public/documents/ena/wfp216586.pdf>

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Guatemala's agricultural research and extension services have decreased significantly over the past 10 years.²³ Agricultural inputs are severely limited. Traditional seeds are generally used rather than improved hybrid seeds. Fertilizer prices have increased in recent years, and subsistence farmers report using less in response. There are limited storage facilities, as well as limited market forecast data, so farmers often sell their surplus immediately after harvest, regardless of the current market situation.²⁴

Food is generally available in markets throughout the Western Highlands. This availability is increased by the nearness of the Mexican border because the markets are supplemented by products from Mexico, increasing supply and lowering prices.²⁵

Incomes are insufficient for the poor to purchase food despite its availability.²⁶ Lack of access to food for the poor is the most important cause of food insecurity in Guatemala. For the reasons described above, most subsistence farmers do not produce enough to support their food needs. Instead, they rely on (badly paid) unskilled manual labor for additional income for food and other purchases.²⁷ Large family sizes exacerbate these problems.

Food utilization is poor in Guatemala due to unsuitable food choices and feeding patterns, which result from low levels of education and are most limited among families with low socio-economic status. Infants and young children are generally fed the same maize and bean-based diet as adults, without appropriate adjustments for their age and development, and the quantity and frequency of these feedings is often inadequate.²⁸ Only 66 percent of indigenous mothers exclusively breastfeed their babies during the first 6 months.²⁹ Diets have very limited variety, with a strong focus on basic grains. Poor households consume few vegetables and food of an animal origin.³⁰ Nearly half of children under age 5 in the Western Highlands are anemic.³¹

In more remote areas of the Western Highlands, the lack of basic services and poor hygiene behaviors lead to frequent illness episodes, which contribute to the poor utilization of food.³² Development actors have noted the need for improved hygiene habits, especially for food preparation; increased hand washing; proper disposal of human waste; and more sanitary water storage.³³ Some of these communities do not have access to health services and are supported by inadequate outreach efforts. Additionally, the use of available services is limited by cultural and language barriers.³⁴

Another threat to food security is environmental challenges. Guatemala is extremely vulnerable to natural disasters, and is one of the ten most vulnerable countries.³⁵ Natural disasters appear to be becoming more frequent due to population growth and climate change.³⁶ Deforestation, soil erosion, and water pollution increase the risk from natural disasters.³⁷ Both droughts and floods contribute to food insecurity by directly destroying crops or by limiting access to markets through inaccessibility of roads.³⁸

²³ U.S. Government. (2011).

²⁴ USAID Office of Food for Peace. (2011).

²⁵ Ibid.

²⁶ U.S. Government. (2011).

²⁷ FEWS NET. (n.d.). Guatemala: Food security framework. Retrieved from <http://www.fews.net/ml/en/info/Pages/fmwkfactors.aspx?gb=gt&l=en>

²⁸ U.S. Government. (2011).

²⁹ Ibid.

³⁰ Government of Guatemala. (2013).

³¹ Chaparro, C. (2012).

³² FEWS NET. (n.d.).

³³ U.S. Global Health Initiative. (n.d.).

³⁴ U.S. Government. (2011).

³⁵ United Nations Office for Disaster Risk Reduction. (2009). Global assessment report on disaster risk reduction (2009). Retrieved from <http://www.unisdr.org/we/inform/publications/9413>

³⁶ U.S. Government. (2011).

³⁷ USAID Office of Food for Peace. (2011).

³⁸ U.S. Government. (2011).

4. Findings

The findings of the baseline study are presented according to five content categories: (1) characteristics of the population, (2) household indicators, (3) agricultural indicators, (4) women's health and nutrition, and (5) children's health and nutrition. Each section includes results for FFP and program-specific indicators, along with relevant results from the qualitative study. The tables in Annex 7 present a tabular summary of all FFP and program-specific indicators, confidence intervals, standard errors, and weighted population estimates for each program area and for the areas combined, along with results for statistical tests of differences between the two programs for each indicator.

4.1 Characteristics of the Study Population

This section provides an overarching picture of the SC and CRS program areas. Estimates of the total population in the survey area and demographic characteristics are presented from the household survey along with results from the qualitative study with respect to migration.

A total of 5,871 household interviews were completed across the Western Highlands region of Guatemala: 2,797 in the SC program area and 3,074 in the CRS program area. Table 4.1a provides estimates of the populations represented in the survey area overall and for specific sub-groups. The characteristics of the households in the survey area are shown in Table 4.1b. The average household included 6.4 household members. Children ages 0-59 months are household members in about 60 percent of all households. Children ages 6-23 months are household members in 29 percent of households. Children ages 0-5 months are household members in almost 11 percent of households. About half of all heads of household completed primary education, and 43 percent had no formal education. Most households included an adult male and female (89 percent) or a single adult female (9 percent).

Table 4.1a. Total Population in the Title II Survey Area by Program Area
[Guatemala, 2013]

	Total	SC	CRS
Total population	408,436	188,255	220,181
Female	211,767	97,861	113,906
Male	196,669	90,394	106,275
Total households (HH)	63,802	29,956	33,846
Male and female adults	5,399	2,457	2,943
Female adults only	715	243	472
Male adults only	57,629	27,224	30,405
Child no adults	58	32	26
Women of reproductive age (15-49 years)	94,320	45,384	48,937
Children ages 0-59 months	60,650	27,264	33,385
Males ages 0-59 months	30,355	13,570	16,785
Females ages 0-59 months	30,295	13,694	16,600
Children ages 0-5 months	6,896	3,158	3,739
Males ages 0-5 months	3,596	1,789	1,807
Females ages 0-5 months	3,300	1,369	1,931
Children ages 6-23 months	19,293	9,262	10,030
Males ages 6-23 months	10,122	4,757	5,365
Females ages 6-23 months	9,171	4,506	4,665

Source: USAID Title II survey in Guatemala (2013), weighted population estimates

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Table 4.1b. Household Characteristics by Program Area
[Guatemala, 2013]

	Total	SC	CRS
Average household size	6.4	6.3	6.5
Percentage of households with children 0-59 months	60.8	61.2	60.5
Percentage of households with a child 6-23 months	29.0	30.4	27.7
Percentage of households with a child 0-5 months	10.5	10.4	10.6
Household headship (% male)	84.0	85.1	82.9
Education level of head of household			
No formal education*	42.6	45.0	40.4
Pre-primary	0.3	0.3	0.2
Primary*	51.9	49.8	53.9
Lower Secondary ¹	2.4	2.6	2.3
Upper Secondary ²	2.2	1.7	2.7
Higher	0.5	0.6	0.5
Gendered household type			
Adult Female no Adult Male	9.4	8.8	9.9
Adult Male no Adult Female	1.1	0.9	1.4
Male and Female Adults	89.4	90.2	88.6
Child No Adults	0.1	0.1	0.1
Number of responding households	5,871	2,797	3,074

* Difference between program areas is statistically significant at $p < .05$.

¹ Equivalent to "Básico" in Guatemala.

² Equivalent to "Diversificado" in Guatemala.

A. Migration

Trends in the qualitative data indicated various forms of migration influence the make-up of communities. At least one individual from every community visited for the qualitative component of the baseline study indicated that individuals within their community migrate. Understanding the various aspects of migration provides context for other topics discussed in this report. In this section, topics discussed include: who migrates, the drivers of migration, and the unintended consequences of migration.

a. Who Migrates?

According to both KIs and PDBs, those who migrate tend to be men. As one respondent from Quiché responded when asked who migrates: "Sometimes the parents. Other times the sons. Frequently the men are the ones that go to the U.S. to look for a job because they want to make money." There is also some indication that women stay home because of cultural norms. One respondent from Totonicapán said,

They are the fathers and sons who are engaged in trading.... Then the family unit is integrated by the mother and daughters that have activities at home. Women and mothers stay in communities, and because of cultural issues they are not allowed to go out.

Respondents in several communities emphasized that younger men who have not yet started a family tend to migrate more often. Therefore, as indicated in the household survey, the majority of households still have both an adult male and adult female present, yet the second largest gendered household type are household with adult females and no adult males. The majority of young men who migrate do so alone. As one respondent from Quetzaltenango described:

Some parents would like to go, but they say they don't want to abandon their children and wives. Because it is necessary to care for the children, women can't go out alone with the children. It is necessary to have two. That is why parents don't go [migrate] anymore, or older people. Because of the responsibility they have at home and with the family.

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Who migrates also varies by the type of migration. When individuals migrate outside of the country, they tend to do so alone. However, with internal migration, there are cases in which the primary migrant brings their family with them. This was especially the case in one community in San Marcos, where there appeared to be a high prevalence of migration to the coast. In those cases, individuals described taking entire families with them and then returning to their home community once the harvest or planting season is over. It is important to note that while the majority of primary migrants are men, some respondents indicated that women also migrate, especially if they are single heads of household.

b. Drivers of Migration

According to the interview and focus group data, the primary driver of internal and external migration is a lack of income and job opportunities. When asked where individuals migrate to and why, one father in San Marcos responded by stating:

Different places, the capital city, Mexico, U.S., Canada. So, different places where people find more opportunities, where there is more income. Imagine in Guatemala our economy is really bad, so then that is the problem, that is why people migrate.

A respondent in Quetzaltenango also echoed the notion of looking for opportunities elsewhere:

Well the truth is that most have looked in the United States because thank God, we have had an employment opportunity, a huge amount of remittances come from there. In other cases, I have also heard that they go to Spain, but it is less. Where I have heard a lot is in the U.S., and not only in one state, but in several, like Virginia, Washington, Atlanta, among others.

KIs confirmed this sentiment. One from SC explained:

Others that are braver go to the U.S. through Mexico, trying to find new opportunities, because people hear from their relatives in the US that it's a place where you have more job opportunities and where you are able to buy more things than the ones they may buy here working very hard. So people say "Ok, I'll take a risk and go there because my friend there even has a car and he just left two years ago, he already has a house and is able to eat three meals a day," so everyone hears that story and they start to say "I'll leave," and everyone motivates more people to go. But they leave because there are no good opportunities here.

For those who migrate internally, the work they seek is often temporary agricultural work that is driven by seasons. For example, in two communities, individuals described working in coffee and sugar cane fields, usually seeking out contractors who hire them for their labor. They stated that they migrate to plant sugar cane on the coast in March, April, and May, and then return in September, October, November, December, and January to cut and harvest the sugar cane. They typically harvest coffee in September, October, and November.

c. Unintended Outcomes of Migration on Communities and Families

While there are clear benefits, such as increased income, to migrating both for the family and for the community, there are outcomes that were not necessarily drivers of migration. Respondents primarily described outcomes in terms of negative impacts on the family. Outcomes are associated with individuals who migrated externally or for long periods. Negative outcomes included disintegration of the family; leaving women at risk of greater levels of poverty; and pain, sadness, and worry over family members who had left. The following excerpt from interviews with a respondent in Quetzaltenango demonstrates the negative outcomes of migration:

For example, it affects those who are in the U.S. There are those that leave their wives, the family falls apart. That, for me, is a problem. Many families, we have seen that, instead of doing something, or if like they stay in the U.S. there are many vices. They come back and they drink. Or sometimes they don't come back with the wife, they separate. There are broken families. Now those who are here in the country, well I believe that there aren't so many problems.

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In addition to the family stress, deportation is an obvious risk for individuals who migrate to other countries. When asked about the effects of migration, a respondent from Quetzaltenango stated:

I see two things. When our brothers go to the U.S., the risk is that they are detained, because they are not declared. [They are] smuggled, because we don't fill the requirements that they ask for at the U.S. Embassy. If they pass, they have the possibility of making a few dollars for the family, and if they don't pass, many people already suffered that.

The risk of deportation is also often accompanied by discussions around discrimination those who immigrated to the U.S. faced, as demonstrated in this quote from a respondent in Totonicapán:

Depends on their luck, because, in the U.S. sometimes one stays illegally. And because of the social security and permission to work sometimes you don't have enough and sometimes one stays as a wetback. They call us that. And, if immigration catches you then you get reported and send [you] back to your country.

There is also some evidence that these negative impacts of migration are also felt when migration is short-term and internal, as one KI from CRS stated:

Then husbands migrate and wives are left alone at the front of the home, then brings with it that they lose income till the husband returns with the money he earned and problems of family disintegration.

Overall, respondents reported more negative effects of migration than positive ones.

4.2 Household Indicators

This section begins with the household survey findings for the Household Hunger Scale (HHS), followed by an exploration of the predictors of household hunger and the results for the Household Dietary Diversity Score (HDDS). Qualitative data, when available, highlight the findings from the household survey with respect to food and beverage sources, access, availability, and diversity.

A. Household Hunger Scale (HHS)

Household hunger was measured using the HHS, a perception-based food deprivation scale. The scale consists of three components measuring inadequate household food access, with each component split into an occurrence question (whether the episode of food deprivation occurred at all in the past four weeks) and a frequency of occurrence question (how many times the episode had occurred in the past four weeks). The responses to the questions are coded and summed into a numerical score (with a minimum possible score of 0 and a maximum possible score of 6) representing three levels of hunger: (1) *Little to no hunger* (HHS score = 0 to 1); (2) *Moderate hunger* (HHS score = 2 to 3); and (3) *Severe hunger* (HHS score = 4 to 6).

Table 4.2a presents the results for the HHS. Overall, 7 percent of households suffer from moderate or severe hunger. Households with an adult female and no adult male are more likely to suffer from moderate to severe hunger (11 percent) compared to households with an adult male and female present (7 percent). From the qualitative data, participants rarely discussed experiences of hunger and often stated that there is always something to eat. Respondents frequently made statements such as “and when there's nothing to it, we eat tortillas with coffee”.

The HHS is based on perceptions of hunger in the past four weeks and thus may be sensitive to the season in which the survey is conducted. The household survey data in Guatemala were collected between April and June of 2013, at the beginning of the lean season. The lean season in the Western Highlands of Guatemala is typically from June through August, which is the rainy season prior to the harvest season; this is the time when the families' reserves have been used up and the harvest still has not come in.

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Table 4.2a. Food for Peace Indicators - Household Hunger Score (HHS)			
Household-level FFP indicators by program area [Guatemala, 2013]			
	Total	SC	CRS
Household Hunger (All Households)			
Prevalence of households with moderate or severe hunger	7.4	7.6	7.3
Adult Female no Adult Male	10.9	12.9	9.2
Adult Male no Adult Female	3.9	6.5	2.6
Male and Female Adults	7.2	7.1	7.2
Child No Adults *	6.5	11.7	0.0
Number of responding households	5,871	2,797	3,074
Adult Female no Adult Male	552	247	305
Adult Male no Adult Female	67	24	43
Male and Female Adults	5,247	2,523	2,724
Child No Adults	5	3	2
* Insufficient sample size (n<30)			

a. Predictors of Household Hunger

Multivariate logistic regression models for moderate and severe household hunger (hereafter referred to as “household hunger”) were developed to further understand factors associated with household hunger for the overall survey area and separately for each program area. Annex 8, Table A8.1 presents statistical results for these models. Independent variables in the model include the following:

- Household composition: Number of prime-aged adults (15-49 years old), number of elder dependents (50 years or older), and number of young dependents (ages 0-14)
- Demographic characteristics of the head of household: Sex, age, and education level
- Socioeconomic status: household poverty and food consumption
- Household agricultural status: Raised crops in the last 12 months, number of farmers in the household, used at least two sustainable livestock practices, used at least two sustainable crop practices, used at least one sustainable natural resource management (NRM) practice, practiced value chain activities, used improved storage practices
- Department

The overall model shows significant differences between the program areas, so predictors are provided separately for each program rather than overall.

In a logistic regression, the significance of individual predictors is based on odd ratios (ORs). ORs indicate the extent to which the likelihood of an outcome increases for each unit increase in the predictor variable. For example, if owning livestock decreases the likelihood of household hunger from 70 percent to 60 percent, this would be equivalent to an OR of $(60/40)/(70/30) = 0.64$. ORs are always positive numbers. An OR of 1 indicates no change in the odds of an event, an OR between 0 and 1 indicates a decrease in the odds, and an OR greater than 1 indicates an increase in the odds. In a logistic regression model, the OR indicates an increase or decrease in the likelihood of an outcome for a unit increase in the predictor, with all other predictors held constant.

The model for the SC program areas shows a low explanatory power, with a pseudo $R^2 = .10$, indicating that the independent variables in the model explain about 10 percent of the variance in household hunger. The model for the CRS program areas had a somewhat better fit, with a pseudo $R^2 = .20$. Better-fitting models require collecting additional independent variables beyond those collected for the current survey.

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Significant predictors for the SC household hunger model include the following:

- Sex of head of household: All other factors in the model being equal, having a female head of household increases the odds of household hunger by a ratio of 1.82.
- Food consumption: Each additional log of Guatemalan *quetzal* (GTQ) spent in food during the last week decreases the odds of household hunger by a ratio of 0.06. Using untransformed food consumption, the change in odds for every additional GTQ would be OR = 0.92.
- Value chain activities: Households that practice the value chain activities supported by the program had lower odds of suffering from household hunger (OR = 0.31). Post-hoc analyses indicate that the value chain activities that best predict reduced odds of household hunger are calculation of costs (OR = 0.29) and having a production plan (OR = 0.36).
- Number of farmers in the household: Each additional farmer in the household decreases the odds of household hunger by a ratio of 0.69.

Deriving recommendations from any cross-sectional multi-variate model must rest on the assumption that the model is causal. If this is the case, the data would indicate that increasing the practice of value chain activities, particularly calculating costs and having a production plan, would have the greatest impact on household hunger among the variables included in the model. The data also indicates that household hunger reduction activities in the SC program areas might focus on female-headed households and those with fewer farmers, as these are the households most likely to suffer from household hunger.

Significant predictors for the CRS household hunger model include the following:

- Number of prime-aged adults: All other factors in the model being equal, each additional prime-aged adult in the household decreases the odds of household hunger by a ratio of 0.88.
- Education level of the head of household: Having a head of household with primary-level or higher education decreases the odds of household hunger by a ratio of 0.35.
- Food consumption: Each additional log of GTQ spent in food during the last week decreases the odds of household hunger by a ratio of 0.02. Using untransformed food consumption, the change in odds for every additional GTQ would be OR = 0.83.
- Department: Households in Totonicapán are more likely to experience household hunger relative to those in San Marcos, by a ratio of 2.57.

If the relationships uncovered by this model are causal, the data would indicate that increasing the education level of the head of household would have the greatest impact on household hunger. The data also indicates that household hunger reduction activities in the CRS program area might focus on those households with fewer prime-aged adults, as these are the households most likely to suffer from household hunger.

B. Household Dietary Diversity Score (HDDS)

The HDDS is based on the number of different food groups consumed by the head of household or any other household members in the past 24 hours. The set of 12 food groups is derived from the U.N. Food and Agricultural Organization. The HDDS ranges from 0 to 12, with lower numbers indicating less dietary diversity. Although the HDDS gives an indication of food groups consumed in the household, the HDDS should not be interpreted as a nutrition indicator reflecting diet quality, but rather as an indicator of food access. Thus it serves as a proxy for socioeconomic status.

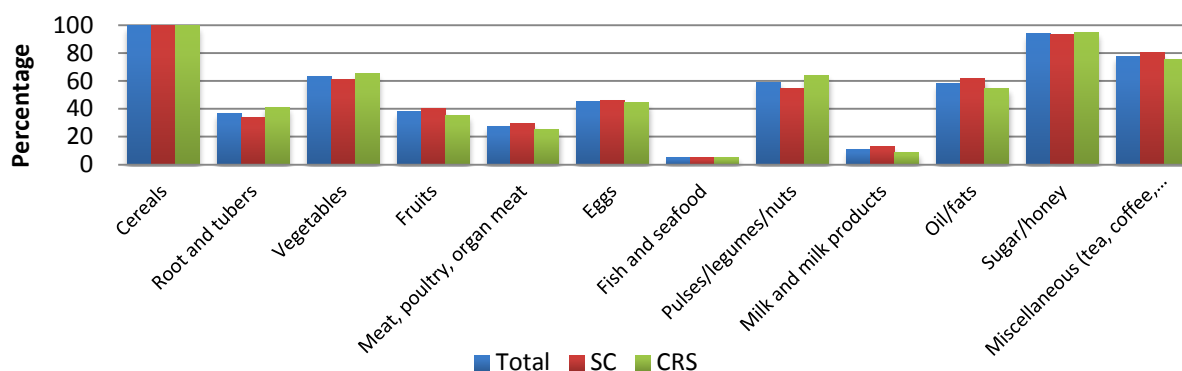
The results for the HDDS are shown in Table 4.2b and Figure 4.2. The overall HDDS score of 6.2 indicates that, on average, 6 of the 12 food groups are consumed in each household. Nearly all households (94 percent) consume sugar or honey, and the majority of households (78 percent) consume other foods such as coffee, tea, spices, sweets, and chocolates.

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Table 4.2b. Food for Peace Indicators - Household Dietary Diversity Score
Household-level FFP indicators by program area [Guatemala, 2013]

	Total	SC	CRS
Household Dietary Diversity (All Households)			
Average Household Dietary Diversity Score	6.2	6.1	6.2
Number of responding households	5,871	2,797	3,074

Figure 4.2 Percentage of Households that Consume HDDS Food Groups



a. Food and Beverage Sources, Access, and Availability

Respondents to the qualitative data interview questions described consuming a variety of food from the various food groups described in the household survey. The main beverages consumed include water, water with sugar, (corn) *atole*, (corn) *gruel*, coffee, and tea with few respondents describing milk as a beverage they consume. Food sources were similar across all departments and involved a combination of purchased and produced foods. The amount of food purchased versus food produced, as well as respondents' dietary diversity, varies depending on several factors, including access to land or the size of their land, season, and income source or employment status. Types of food consumed are often restricted based on the availability of food. When asked how she makes decisions about what meals to prepare, a female head of household from Quiché stated, "We decide that we are going to eat that because we can't access anything else; that is how it has been decided." Therefore, although women tend to have the sole responsibility over decision making with regard to household food consumption and preparation, the food they prepare is often constrained by household income and by limited access to and availability of food.

Respondents also stated that because their plot size is small, they are limited in terms of crop diversity and quantity. Limited pest control, farming techniques and environmental challenges such as drought, cold weather that yielded in ice, hail and frost, strong storms and wind further compound problems with crop yield. When crop yield is lower, respondents either reduce their food intake or, in cases where financial resources are available, purchase more food. A male caregiver from San Marcos expresses this sentiment as follows:

We buy some and produce some—for example, corn, potato, fava beans—but this year I don't think we'll have any. The crop will fail. The beans we plant sometimes don't grow because it's too cold. Therefore, we have to make money to buy them in San Pedro. For example, noodles and eggs, if we have hens that lay, well, we take them, but if not, we deal with it. For the same reason, here in the store it is very expensive, each egg cost 1.50 quetzals; it has gone up a lot, so we have to buy them like that.

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Furthermore, respondents reported greater access during the rainy season to various crops and leafy greens that grow around the roads or in the cornfields. The difference in crop type between the rainy and dry season is also more noticeable for respondents who tend to produce rather than purchase their food. In describing the difference between the rainy and dry season, a male farmer from Quetzaltenango stated:

In the rainy season there are herbs, the tip of the garbanzo, and everything grows between the corn; even if you have to buy it, it is cheaper. But in the dry season there is nothing to eat. In the summer there is rice, *piloy* (beans), *ixtapacal* (lima beans), and others, but it's dry.

As highlighted in the household survey, the consumption of meat and poultry is also low. A male head of household from Quetzaltenango described his lack of dietary diversity in the following way:

About that thing you call nutrition. To tell the truth we do not eat anything balance, we do not have much of everything. What we eat the most is lima beans, beans, and herbs. When we get money, we buy meat one time a week. We do not buy meat because there is no money.

The focus group and interview data indicated that households engaged in raising livestock tend to consume more poultry and eggs, especially in cases where income is limited. Decision making around consumption versus sale of crops and livestock varies, depending on availability of food and income. For example, a female head of household from Quiché stated:

We eat chicken, we don't sell them. We also use the chicken to buy corn and when we don't have anything to eat we eat our chicken. Most people don't sell them, but when they need something they do. For example when you need to buy something you can exchange the chicken or when the men have no job, then we need to eat them.

Income sources and employment status also play a significant role in food source. Respondents who are not farmers and have a stable form of employment tend to purchase the majority of their food. For those with unstable income sources, the amount of food they are able to purchase varies. Some respondents stated that when income is low, they limit what they buy, which further limits their dietary diversity.

In addition to the ways in which land, season, and income affect food access and availability, respondents described varying sentiments with regard to availability and access to food, including how it has changed over the past few years. Whereas some respondents state that availability is reduced due to decreases in land availability and limited business opportunities, others state that it has increased due to the increase in markets. Yet those who discussed purchasing food from markets also mentioned an increase in the price of food. Once again, differences tended to depend on whether respondents produce versus purchase the majority of their food. Some farmers also discussed the high price of fertilizer as having a significant impact on their yields and on the price of food. Food produced during farming season is usually insufficient for the entire year, and even farmers described having to purchase food at certain times of the year. Overall, both KIs and members of the community expressed the importance of food production as a way to increase access to food and to increase dietary diversity. KIs discussed food security as related to production, consumption, and availability. Therefore, because of limited access to land, water, farming techniques and tools, community members are limited in their ability to achieve food security. Section 4.3 provides further details about agricultural production.

C. Household Poverty Levels

This section presents poverty indicators derived from the household survey followed by qualitative data regarding sources of income and roles, responsibilities, and decision making in income generation.

Poverty indicators are based on household expenditures, which are used as a proxy for income. Income in most developing countries and rural areas is difficult to measure, and expenditure data are typically less prone to recall error and are more smoothly distributed over time than income data. FFP poverty measures include: percentage of people living on less than \$1.25 a day, daily per capita expenditures, and mean depth of poverty. Table 4.2c provides the results for these indicators.

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Table 4.2c. Food for Peace Indicators - Poverty

Household-level FFP indicators by program area [Guatemala, 2013]

	Total	SC	CRS
Poverty (Household Members)			
Percentage of people living on less than \$1.25/day	44.0	44.2	43.8
Adult Female no Adult Male	25.8	20.1	29.6
Adult Male no Adult Female	16.3	16.1	16.4
Male and Female Adults	45.1	45.5	44.8
Child No Adults ¹	0.0	0.0	0.0
Daily per capita expenditures (Constant 2010 USD)	1.9	1.9	1.9
Adult Female no Adult Male*	2.6	2.7	2.5
Adult Male no Adult Female	3.0	2.8	3.3
Male and Female Adults	1.9	1.8	1.9
Child No Adults ¹	4.4	3.7	5.7
Mean depth of poverty ²	11.9	11.8	11.9
Adult Female no Adult Male	6.8	4.4	8.4
Adult Male no Adult Female	2.3	1.2	3.1
Male and Female Adults	12.2	12.2	12.2
Child No Adults ¹	0.0	0.0	0.0
Number of household members in responding households	37,434	17,529	19,905
Adult Female no Adult Male	2,172	898	1,274
Adult Male no Adult Female	153	62	91
Male and Female Adults	35,098	16,561	18,537
Child No Adults ¹	11	8	3

¹ Insufficient sample size (n<30)

² Expressed as percent of poverty line

* Difference between program areas is statistically significant at $p = .05$.

Extreme poverty is defined as having an average daily consumption of less than \$1.25 USD per capita, converted into the local currency unit (LCU) at 2005 Purchasing Power Parity (PPP) exchange rates, or around 8.7 GTQ daily per capita at 2013 prices (see Annex 4 for the methodology used to compute poverty indicators). Results from the survey indicate that 44 percent of the population in the program areas is living below the poverty line. There is a lower rate of extreme poverty in households with only one adult male or female compared to households with male and female adults.

Daily per capita expenditures in the survey areas is defined as the average daily per capita consumption, expressed in constant 2010 USD at 2005 PPP adjusted to 2010 US prices. Daily per capita expenditures are on average \$1.90 USD per day, per person, with similar values in both program areas. On average, food consumption is the main consumption category, representing 52 percent of the total average consumption. Of the 101 food groups included in the food consumption module, corn is clearly the most important item, with average per capita consumption of corn representing about 10 percent of total daily per capita consumption. Besides food consumption, occasional expenditures are the second most important consumption category, representing 23 percent of total expenditures. The main occasional expenditures, as a share of total consumption, are fuel wood (8 percent) and occasional medical expenses, such as drugs, medical exams, and hospitalizations (5 percent). Other important expenditures include soap and electricity (both 2 percent). These patterns of consumption are similar for both program areas.

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Finally, the mean depth of poverty is defined as the average of the differences between total daily per capita consumption for the poor and the poverty line, expressed as a proportion of the poverty line. This indicator is useful in understanding the average daily per capita amount that would have to be transferred to the poor to end poverty in the survey area. It is the sum over all individuals of the shortfall of their real private consumption per adult equivalent from the poverty line, divided by the poverty line. One way to interpret the mean depth of poverty is that it gives the per capita cost of end poverty, as a percentage of the poverty line, if money could be targeted perfectly. Thus, with a mean depth of poverty of 11.9 percent in the program areas it would cost 11.9 percent of the poverty line per person in the program area in order to end poverty through selective transfers.

a. Income Sources

Qualitative data indicate that income sources vary and are unstable. Across all departments, respondents identified few primary sources of income: small-scale agricultural production (both the sale of crops and animal rearing), casual and opportunistic labor, masonry, and work acquired through internal and external migration. A KI from SC summarized the income-generation trends in the following way:

In this area many people work helping other farmers or sometimes as masons, but the activity that pays better is when they go to the south and cut sugar cane. This work lasts around three or four months and there, the people earn much better wages. I would say one of the best solutions to a better income is immigration, especially when they go to the U.S.

In addition to the aforementioned sources of income, respondents residing in the CRS communities mentioned textiles, selling handmade clothing, and handicrafts as additional sources of income. According to a KI from CRS in Totonicapán,

I would say there are more traders, people selling clothing, handicrafts, and textiles.... They have a greater potential of natural resources such as forests. In San Marcos the livelihood is still more to do with agriculture but not with ideal conditions. There are small pieces of land, and they are worn.

Income sources also vary depending on the season, with respondents describing more opportunities for employment during the peak of the agricultural season. Several respondents and KIs discussed a decrease in the income generated from farming due to the reduced availability of land.

Few respondents discussed being able to meet all household needs based on one source of income. In order to meet household needs, respondents need to diversify their income sources or rely on pooled income from several members of the household.

b. Roles, Responsibilities and Decision-Making in Income Generation

The majority of male and female respondents in the qualitative interviews, across all departments, stated that men are the primary income providers. Respondents identified beliefs about male versus female roles and responsibilities in income generation. In a FGD with women from Huehuetenango, the following dialogue took place:

Interviewer: Do women generate income or not? (We're talking about your home and community.)
Participants: Men are responsible for earning. (Several voices).
Interviewer: The truth, we do not earn.
Participant: We work from 6-6, but no one pays. (They laugh, several voices at once).
Interviewer: Is it work without pay?
Participant: Ah, yes it is. He is the one who earns.

Members of a focus group conducted with male farmers in Quetzaltenango expressed varying sentiments on who is responsible for generating money at home. One respondent stated:

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The one responsible for providing money to the family is the man or husband. So, the mother doesn't go out and work because she has other responsibilities in the home. In some cases some mothers go to work to make money but that is rare; it is more common that the father is the one responsible for that.

Another respondent from this same group expressed a different sentiment and stated, "Of course women can help out their husbands so I think that both are responsible.... For me it is both my wife works and she contributes."

Although respondents described men as primary providers, several women also bring income into the households. Focus group and interview data indicate that the majority of women bringing income into the households do not have a man present or stated that their husbands are earning an insufficient amount of income to meet household needs. There is also variation in the tasks that women without husbands perform. For example, although farming is primarily performed by men, a KI from Quiché stated, "There are a few women, not all, who work hard. They are the ones who do not have husbands. They go to the field and see what they can do, because there is no one to bring home food." Common income sources for women include the keeping and selling of livestock, washing clothes for neighbors, and making clothing for sale.

In cases where women are married and supplementing household income, their income source is still viewed as secondary to or of less value than the income generated by men. One of the primary reasons for this distinction is that the tasks that women do to earn money pay significantly less than those that men do. Therefore, in a few hours of work, men are able to earn what women make in a full day of work. A female caregiver from Quiché describes this disparity as follows:

Interviewer:	How much does a man earn in a day?
Respondent:	Forty for the day.
Interviewer:	What about the women—how much do you earn if you work in agriculture?
Respondent:	Fifty a week...for the <i>huipil</i> (typical blouse) 40 quetzals, and it takes a week if engaged in hand sewing; it takes them a month and only pay them 200 quetzals and that's why women do not have money.

In households where income is insufficient to meet household needs, children are also involved in income-generating activities or responsible for assisting parents in their income-generation activities. Several respondents stated that children begin working at an early age. When asked why this was the case, a female head of household from Quetzaltenango stated, "I think it is by poverty and partly because they say to their children you have to work to help me bring something to eat." Another female head of household from Quiché stated, "The children have to help their parents to buy their things because we are trying to get more money.... From the time they are 10 or 12 they begin working." The support from children to supplement household income continues into adulthood. Several respondents stated that without the financial support from their children, they would not be able to meet household needs.

Decision making on how to spend the income earned varies by household. Whereas in some households, men stated that they are the primary decision makers, in other households men stated that their wives make the decisions because "women are better at managing the finances." In other cases, respondents described decision making as a joint endeavor between various members of the household.

D. Household Sanitation Practices

This section presents household sanitation indicators generated from the household survey data, followed by data gathered through the qualitative study regarding water sources and treatment, latrine utilization, and drivers of hand washing. Poor sanitation practices are associated with increased morbidity and mortality. Water treatment prior to drinking is a predictor of stunting in communities within the SC program area; and water treatment prior to drinking and improved sanitation facilities are predictors of stunting in the CRS program area. (See section 4.5A, Predictors of Stunting.)

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Household sanitation practices are assessed based on three standard FFP indicators: (1) percentage of households using an improved drinking water source, (2) percentage of households using improved sanitation facilities, and (3) percentage of households with a cleansing agent and water available at a hand washing station. Table 4.2d presents the results for these indicators, and Table A9.2 in Annex 9 provides a further breakdown of the components for each indicator.

About 20 percent of households use an improved drinking water source. Although 48 percent of households reported having access to an improved drinking water source, only 65 percent reported that water is generally available from the source, and 54 percent reported that water is not available from the source for a day or more during the past two weeks. The two most common sources of improved drinking water are water piped into the home or yard or a public or private well. About 52 percent of households do not use an improved drinking water source, but use surface water from sources such as rivers, lakes, dams, canals, and so forth. When asked what methods are utilized to make water safer to drink, 93 percent of households reported boiling their water. Only 5 percent of households reported that they do nothing to make their water safer to drink.

Table 4.2d. Food for Peace Indicators - Water, Sanitation, and Hygiene (WASH)			
Household-level FFP indicators by program area [Guatemala, 2013]			
	Total	SC	CRS
WASH (All Households)			
Percentage using an improved drinking water source	19.9	21.5	18.5
Percentage using improved sanitation facilities	51.6	51.8	51.4
Percentage with cleansing agent and water available at handwashing station	76.5	77.8	75.3
Number of responding households	5,871	2,797	3,074

About half of households reported using a non-shared improved sanitation facility, either a pit latrine slab (41 percent) or flushing to a septic tank or sewer system (10 percent). Another six percent of households reported using a shared improved sanitation facility. Households that do not use a non-shared or shared improved facility use either an open pit (34 percent) or nothing (8 percent).

Interviewers observed the presence of water and soap, detergent, or another cleansing agent at the place for hand washing in 77 percent of households.

a. Water Sources, Treatment, and Use

As reflected in the household survey, most respondents interviewed in the qualitative study reported using non-improved sources of drinking water. Some respondents discussed having access to piped water, either directly to their dwelling or into their yards. In cases where respondents did not have access to piped water or when the water supply at their dwelling was depleted, respondents mentioned surface water sources or wells as their primary sources of water.

Although some respondents discussed an improvement in access to water over the past years, others stated access to water and clean water is lacking in their communities. For example, a male caregiver from San Marcos stated:

In the case of potable water in the community, we have many problems with water. Before, we had it daily, but now, no. That is why I was obligated to open a well to be able to supply ourselves. In summer, the mayor opened a tank but there was hardly any water, it was very little. So these are needs that we have, at a community level, this is priority number one, water.

Seasonality also affects access to water, with respondents reporting easier access during the rainy season and occasional scarcity during the summer months. The collection of rainwater accounts for easier access

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to water during the rainy season. Although the majority of respondents do not use rainwater as a primary source of drinking water, they utilize it for other needs, such as bathing and washing clothes.

Regardless of the source of water, the majority of respondents across all communities reported boiling water as the primary form of water treatment. Women have the primary responsibility for boiling water and reported boiling times ranging from five to 15 minutes. Respondents rarely discussed self-chlorination as a primary form of treatment. A male caregiver from San Marcos stated, “I sometimes put some drops of chlorine in the container when I get it from the well but we usually boil.” Another less frequent form of water treatment described by a male head of household from Quiché is a filter, which he received from an organization working in his community.

b. Latrine Use and Desired Improvements

As in the household survey, focus group and interview participants described using both improved and non-improved sanitation facilities. Respondents were asked whether they had access to a latrine and, if so, what type—for example either a *letrina* (latrine-improved toilet) or a *pozo ciego* (cesspool or cesspit-non-improved toilet). Among those with access, most mentioned cesspools/cesspits, and a few mentioned toilet bowls that flush to septic tanks or piped sewer systems. The terms *letrina* and *pozo ciego* were sometimes confused and were used interchangeably by both participants and interviewers. Yet, those who mentioned having sanitation facilities still expressed the need for improvements and the need for information and training on proper use and maintenance of latrines. A participant in a male focus group discussion from San Marcos stated:

We are not used to only the hole but also the toilet, the seat was placed, we did not cover it, and no ashes were applied because of the ignorance. If an institution comes to explain all this to us, we will do it gladly.

Suggested improvements to latrine systems mentioned by respondents include improving the surroundings, cleanliness, and having a latrine with a drainage system.

Those without access to latrines reported open defecation but are aware of the risks and benefits of latrines. Some of the disadvantages discussed were contamination of the water source, air pollution, flies, risks to children and other family members, and potential illness. The majority of respondents without latrines reported a desire to have one, but cited limited finances as the primary barrier.

There were varying perspectives about the appropriateness of open defecation. Whereas some respondents stated that it is embarrassing to defecate outdoors, others did not view it negatively. A KI from Quetzaltenango discussed her observations of latrine use practices as follows:

I see no difference, more than anything it has to do with hygiene habits. I have seen people with nice houses, better than mine, but their hygiene habits are lacking. They even have bathrooms in the house but continue to relieve themselves in the fields. I even think it would be timely that in the schools there should be a hygiene campaign or cleanliness training.

D.3 Decision Making and Drivers of Hand Washing

As in the household survey, most respondents to the qualitative interviews reported washing their hands multiple times a day. At the very least, respondents reported washing hands before eating and after the use of the latrine, yet some described more frequent hand washing. For example, a female farmer from San Marcos described the hand washing routine of her household:

We wash hands very often. The children do it when they get up, before they take breakfast, and after breakfast they go to school and when they come back, they wash their hands to have lunch. Then, after lunch, the children go again to wash their hands to do school homework. Then, in the afternoon, before dinner, they wash them again.

Although most respondents mentioned hand washing, fewer reported the frequent use of soap. Two primary reasons were mentioned for limited or no use of soap. The first is availability of financial

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resources to purchase soap and the second is the visibility of dirt on one's hands. A male farmer from Quetzaltenango stated, "To tell the truth, we only use soap when we have manipulated organic fertilizer or something dirty, not always." Few participants mentioned the use of disinfectants as an alternative to washing hands with soap and water.

The majority of respondents were cognizant of the importance of hand washing practices, stating that hand washing is necessary to prevent diseases. The following exchange with a female caregiver from Totonicapán provides an illustration:

Interviewer: Ah, okay, how frequently do you wash your hands?
Respondent: Whenever we touch something dirty.
Interviewer: Constantly.
Respondent: Yes, because if not we get sick.
Interviewer: And the children?
Respondent: Otherwise, they get sick.

4.3 Agricultural Indicators

Agriculture and agriculture production were key factors of both the household survey and qualitative components of the baseline study. This section presents the results of the agriculture indicators from the household survey and the qualitative data regarding types of farming techniques utilized, roles and responsibilities of individuals undertaking farming, and challenges experienced.

The agricultural component of the household survey was completed in 5,548 farming households—2,576 in the SC program area and 2,972 in the CRS program area. The majority of farmers (95 percent) reported cultivating corn and about two-thirds (68 percent) reported cultivating beans. About 38 percent of farmers cultivated herbs or vegetables for household consumption, and 58 percent reporting having fruit trees on their land. Livestock is raised by 87 percent of farmers. The majority of farmers (92 percent) reported consuming products from their livestock or land, and 44 percent of farmers reported selling products from their livestock or land. See Table A9.3 in Annex 9 for a breakdown of these results for each program.

Farmers were asked about financial services, value chain activities, and use of agricultural and storage practices. Table 4.3 presents the results for these agricultural indicators.

About 16 percent of farmers reported using financial services in the past 12 months—either savings, credit, or insurance. Significantly more farmers in the SC program area (20 percent) used financial services than in the CRS program area (13 percent).

The value chain activities included as part of the survey included market-oriented production, calculation of cost of production for the market, keeping production records, and developing production and sales plans. Overall, 14 percent of farmers reported practicing at least two of these value chain activities. More farmers in the SC program area (16 percent) practiced value chain activities than in the CRS program area (12 percent). Figure 4.3a shows that the most common value chain activity practiced is market-oriented production. Fewer than 10 percent of farmers reported practicing each of the other value chain activities, and 58 percent of farmers reported that they did not practice any value chain activities.

Sustainable agricultural practices were categorized into three subgroups: (1) crop practices, (2) livestock practices, and (3) natural resource management (NRM) practices. Overall, 57 percent of farmers reported using at least two sustainable crop practices, 10 percent reported using at least two sustainable livestock practices, and only 1 percent reported using at least two sustainable NRM practices (see Table A9.5 in Annex 9). Fifty percent of farmers reported using at least three of any sustainable agricultural practices and 8 percent of farmers reported using improved storage practices (see Table A9.6 in Annex 9).

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Table 4.3. Food for Peace Indicators - Agriculture
Agricultural indicators by program area [Guatemala, 2013]

	Total	SC	CRS
Percentage used financial services (past 12 months)*	16.1	20.2	12.6
Percentage practiced value chain activities (past 12 months)**	13.6	15.9	11.5
Percentage used three sustainable agricultural practices (past 12 months)**	50.1	50.2	50.1
Percentage used two sustainable agricultural (crop) practices (past 12 months) ¹	57.1	58.8	55.7
Percentage used two sustainable agricultural (livestock) practices (past 12 months) ²	10.0	9.7	10.2
Percentage used two sustainable agricultural (NRM) practices (past 12 months) ³	1.1	0.9	1.3
Percentage used improved storage practices (past 12 months) ⁴	8.4	8.7	8.1
Number of responding farmers	5,548	2,576	2,972

* Difference between program areas is statistically significant at $p < .01$.

** Difference between program areas is statistically significant at $p < .05$.

¹ Includes use of soil conservation practices; use of organic fertilization; household garden production and production of native herbs for both program areas; management of fruit trees; and use of improved seeds for beans for SC.

² Includes improved livestock facilities (roof, wall, water and food) for rabbits, goats, pigs and poultry; vaccination of poultry for both program areas; and management of goats (3 of 4: deworming, vaccination, hoof removal, vitamin supplementation) for SC.

³ Includes agro-forestry, reforestation, management of forest plantations, management of natural reforestation and production of plants for reforestation for both program areas; and watershed reforestation for SC.

⁴ Includes storage practices for corn and beans for SC and storage practices for corn for CRS.

Figure 4.3a. Percentages of Farmers Practicing Value Chain Activities

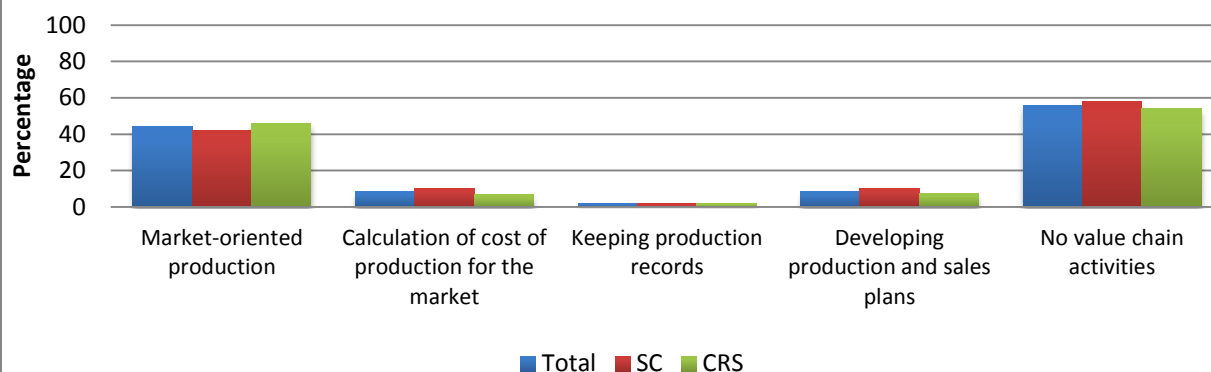


Figure 4.3b. Sustainable Crop Practices Used by Farmers

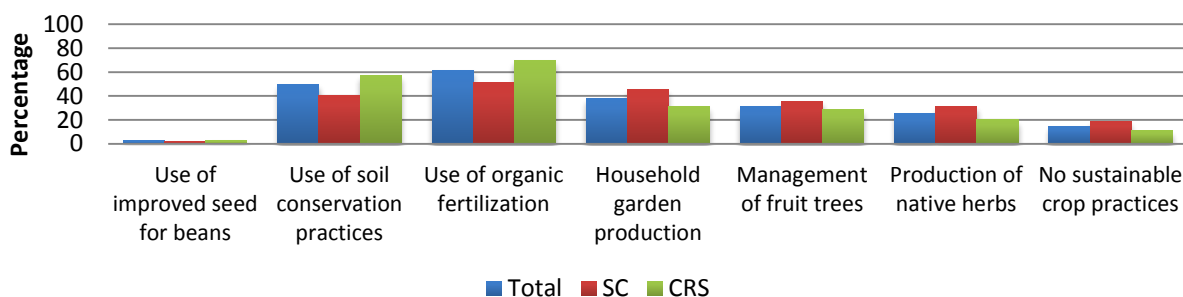
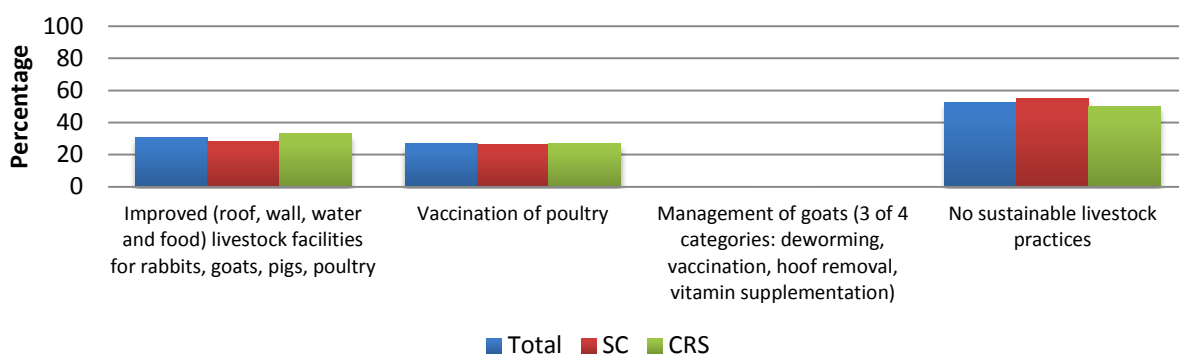


Figure 4.3c. Percentage of Farmers Using Sustainable Livestock Practices



A. Types of Farming and Techniques

The qualitative data provide insights into the items farmed by individuals and whether those items are produced for their own consumption or for sale. Topics covered in this section include the types of crops and livestock produced, the techniques used for production, and how the sales process works.

During the qualitative interviews, the primary crops that individuals reported farming for consumption are corn, beans, and potatoes. The second most frequently named items were squash, lima beans, and chayote (*guisquil*). In addition to these crops, some respondents indicated that they raise poultry, including chicken, hens, and sheep. When individuals discussed raising animals for subsistence, they tended to do so in combination with raising them for sale. In addition, they use hens to produce eggs for consumption and the horses or a cow to produce fertilizer for their crops.

Analysis of the qualitative data identified three primary trends regarding farming as a source of income. First, in some communities, certain crops are produced exclusively for sale. For example, in Chugüexa I in Quiché, there are individuals who produce sweet peas for sale, but do not consume them. Likewise, in Ojo de Agua Camino Real in Quiché, the community has a long-term relationship with intermediaries that purchase green beans (some called them French beans) and chili for export. Individuals from the community generally do not consume these items but produce them exclusively for sale, as demonstrated in this exchange between an interviewer and a KI and agricultural expert:

Interviewer: What products do people sell here in the community?

Key Informant: The products we sell most are green beans and chili.

Interviewer: The green beans are consumed or all sold?

Key Informant: We sell it all, because we eat black beans. The ones from here in Guatemala.

Interviewer: There isn't a market for selling other things like beans or tomatoes?

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Key Informant: No, here it's only for consumption. Because we plant little since we also have to tend corn. But we dedicate more time to the green beans, because those are for export.

The second trend identified is that individuals calculate the amount of their crops they will need for the year and then sell what remains. As a respondent in San Marcos explained:

We sell a very small amount. For example, with our corn, we calculate how much corn we need for a year. If we have spare corn, that is the amount that we are going to sell. If there is no corn left, then we don't sell it.

When individuals do have crops remaining, they tend to sell the highest quality and consume the lowest quality, as demonstrated in an interview that took place in a community in Quetzaltenango:

Interviewer: For example, the potatoes that you plant, do you always do it the way you are telling me, some for selling and some for eating? Is it always like that?

Respondent: Yes, always.

Interviewer: More or less, how much do you use for eating and how much for selling?

Respondent: For eating, there is first, second, and third class potatoes. Before first class there is one called super. In our case, we do not produce super, we put in first class. From that we make two or more quintals. That is what we sell. As I am telling you, I only plant two boxes of seeds, more or less one quintal, and I harvest eight quintals, and that is what I sell. Now from second and third class, that is what we eat. And the rest, the ones that get worms, we give that to the pigs.

A KI from SC confirmed the aforementioned phenomenon by stating: "Sometimes the people sell what they produce, even sacrificing their own needs. Take me for example, the fact that I am selling produce doesn't necessarily mean that I eat as [much] I should."

The third primary trend identified is that most livestock and poultry raised by individuals serve as sources of income. The three most frequently identified animals/birds are hens, chickens, sheep, and cows. Most interview participants indicated they consume 10 to 20 percent of their livestock, though there were some cases where they indicated eating up to 50 percent. As one respondent in Totonicapán stated, "Well, in the case I have 20 chickens, I eat two and I sell 18." However, in another community in Totonicapán, a respondent indicated that if he had a dozen chickens, he would eat half and sell the other half. When asked why they sold the majority of their livestock, respondents provided two common responses. First, they needed to sell the animals or poultry to pay for other household needs; and second, they did not have the land or ability to keep large animals. Following is an excerpt from a focus group discussion with farmers in Quetzaltenango:

Respondent One: Well, I buy my pigs, truth is, my wife cares for them. When they grow, we sell them and with that we buy clothes for the children. That is why they participate in caring for the animals too. Because they say it is to buy them clothes, and they get excited. And what is left over is for the mother.

Respondent Two: In other cases, most of what we make [is] by raising animals, like pigs. All are sold, because we can't eat them. They are too big.

The majority of individuals who participated in interviews said they learned their farming techniques from family members or from individuals they knew. As a male caregiver in San Marcos stated:

We learned from our fathers. Possibly my father learned it from his father too. Practically, there is no one that came to teach us. But we inherit it. Or, how could I say it, through our parents' teaching.

However, two KIs who specialized in agriculture indicated that activities are occurring at the community level to help improve farming techniques. Furthermore, there is some indication, through descriptions of

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farming techniques by beneficiaries, that they had an organized approach to farming. As a farmer in Quiché described:

First, we till the land and cover the stalks. We clean the grass, dig holes to cover the corn, and then we count six kernels. But if six don't grow, we count and recount what is missing to complete the six. When the corn grows, we till the land, so that the weeds don't grow. We till twice, cut the grass twice, and then we harvest. We bring the ears of corn and remove the leaves.

Despite this progress, in many interviews, individuals indicated that they would like further training and support.

B. Roles, Responsibilities, and Decision Making in Agriculture

For the most part, in the communities visited for the qualitative data collection, roles and responsibilities for agricultural and livestock production are fairly clearly defined. In all eight communities, respondents—both KIs and PDBs—indicated that men are generally responsible for crop production yet women contribute to post-harvest activities and other duties such as throwing fertilizer. Women are mainly responsible for the rearing of fowl and animals. The following exchange with a focus group of female caregivers from Paraje Pajomet in Totonicapán highlights the different roles.

Interviewer: Who is the one who plants at home?
Respondents: It is the husband, because he goes out to the field to plant corn.
Interviewer: And the man is the one who goes to the field. Who is in charge of the harvest?
Respondents: Us, we are in charge of taking all the leaves off in the house.
Interviewer: Who is in charge of overseeing and caring for the animals?
Respondents: Us, we are the ones in charge.

There is an indication that the participation of children falls along these same gender lines, as demonstrated in this quote taken from a FGD with female caregivers in Totonicapán:

Interviewer: So, the boys, from a young age, the Dad prepares small hoes for them so that they can work in the field?
Respondents: Yes, the boys go to the fields. And the girls, we buy them small grinding stones so that they can help out at the home.

When asked why this division of labor existed, trends in responses indicated that men are better suited for work in the field due to their strength, and that rearing animals allows women to stay near the home where they have other roles and responsibilities such as cooking, cleaning, and tending to the children.

To explore these gender lines further, the qualitative interviewers asked respondents if they ever helped their spouse with the farming of crops or the rearing of animals. In most cases, the men indicated that they handled everything on their own, and that the animals are primarily the responsibility of the woman (or women) in the household. When the women responded, even in communities where there is little indication of a decline in pervasive machismo, the women indicated that they did assume some roles and responsibilities when it came to crop production. In one community in San Marcos, a woman indicated that she helped her husband spread manure. In a community in Huehuetenango, women who participated in a focus group said they always helped when it came to the production of crops such as potatoes. However, even though women did participate in crop production, they often referred to their husbands as the primary decision maker. As one woman in Huehuetenango stated during an interview:

Agriculture, we each sow a little. So everybody owns a bit. But the husband is always the boss because he sows the most. Now we women sow just a little. Males always plant more, and they are the ones with the majority of the crops.

These findings from the qualitative data indicate that women's contribution to agriculture practices are not always recognized by either women or men. However, roles and responsibilities are beginning to change out of necessity. In communities where there are further advances in the rights and participation of

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women, women tend to take on a greater role in crop production, just as men in those communities also aid in the production of animals. As described earlier, there is a tradition of internal migration in Guatemala, and an increasing number of individuals, primarily men, are seeking opportunities in other countries such as the U.S. Given the large migration of men, women are beginning to take on agricultural roles that they did not take on in the past. This is also the case for widowed or abandoned women.

C. Challenges in Agricultural Production

In order to help understand both consumption practices and income generation, it was important to gather information about the challenges PDBs and KIs identified as possible hindrances to agricultural production. The most frequently named challenges are not entirely surprising. They include: a lack of financial resources to invest in products they need to improve their yield (fertilizer, insecticides, and seeds); a need for further technical assistance to help improve practices; a need for access to a reliable water source; and vaccinations for animals to keep livestock and poultry healthy. Two other challenges that individuals raised are less obvious, but could greatly affect overall productivity. First was access to land. In a number of locations, individuals did not own any land, and therefore would have to rent from other land owners, which is often not affordable, and they end up using much of what they produce just to pay for the land they rent. For those individuals who own land, the size of the plot is not sufficient to produce crops or animals at a capacity that would allow them to sell their products. The small plot size is a result of family land ownership diminishing over time through inheritance. Over the years, as generations continue on, the land is divided and re-divided for the next generation. This causes the plots to be so small that farmers cannot produce enough yields for sale and can rarely produce enough food for consumption. In Huehuetenango, a female farmer explained this process:

You inherit it from family. That is why as time passes there is less of it. My grandfather had a lot of ground. But there were many [children]. Then each got a part. The part we got was smaller. And now we are entitled to very little.

One farmer from Quetzaltenango who participated in a focus group shared his concerns of how he would not have enough land for his children if he relied on this same technique:

But...there is a big problem. And it is that we no longer have land. We have some small plots. Even though the children want to work the land, how will they? And where will they go? It is worse if you have four or more children. What lands or plots will we leave our children?

This farmer's concerns also raise another issue that communities are facing. In most communities visited by the qualitative team, respondents indicated that farming is a household-based practice, as the Quetzaltenango farmer suggests. Entire families did not come together to share plots, but rather divided them amongst family members. Furthermore, respondents indicated that they rarely collaborated as a community to improve their production. This culture of individualism is demonstrated in a response from a farmer who was interviewed in a community where everyone in the community farms the same product for exportation. However, they do not work together in this effort:

The thing is, we don't have money. And that is hard for us. Because we don't have enough money to take good care of the production. It's hard for us, and that is why I say that life here is hard. Nobody says anything to us such as, "I'm going to help you with this." Here, it is not like that. Most of us live that way. Here, everyone has to find out how to survive.

This is a challenge that the KIs identified and are encouraging communities to work around. One KI in Totonicapán stated:

The idea is that the same amount of land is proportional to the production and service conditions of irrigation water. Then the quantity of families involved in these processes is minimal. Our idea is that for the same amount of ground they have, several families could join and have the production together. These are the processes we want to implement.

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Although several of the challenges discussed are difficult to target, not only did KIs provide insight on how to resolve some of these difficult issues, as the quote above illustrates, they also discussed challenges, such as the need for technical assistance and vaccinations, which are within the scope of both programs.

4.4 Women's Health and Nutrition Indicators

A. Community Health Issues and Health Care Services

Before examining women's health in particular, it is important to examine some of the qualitative findings about the types of illnesses encountered within the communities, access to health care services and the types of health care utilized.

The most frequent illnesses mentioned by qualitative respondents in both program areas were gastrointestinal problems (which they most commonly refer to as a stomachache), cough, cold, fever, and parasites.

The options for treatment were also similar in both program areas. Many individuals reported trying to medicate household member themselves, either with natural/herbal remedies, such as lemon or St. John's Wart, or through the purchase of medication. As one respondent in Totonicapán said: "In my case, I buy medicine like Viro-Grip anti-flu, and that is all. It gets cured." When medications did not work, respondents reported escalating to the next level of care until the problem was resolved. Focus group participants in Quetzaltenango described this process as follows:

Participant One: Depends on how serious. If it is light, we go to the health center. If it is serious, we go to a hospital, regional or private depending on the capacity to pay.

Participant Two: Well, to a private one if there is money, otherwise, you don't go there. In this case, national, because you only have to pay the bus ticket.

Participant Three: Well, about five years ago, there was good care at the hospital and in the health center. Now, there is no medicine. There are workers at the health center. But it is empty. So one says, "Why go?"

Participant Four: It's true. They are good people, the ones who take care of you. But it's no good if they can't cure you. Many people have died due to poor or no medical care in these places. There is no government support.

While not explicitly explained in this excerpt, in many cases, in order to receive treatment, individuals need to pay for it. Health centers and other options that are free or more affordable are often not adequately equipped to address individuals' medical needs. In the most challenging circumstances encountered by the qualitative team, there are no health care facilities, medical treatment, or medicines available, even for purchase, in their own communities. These individuals must travel a substantial distance to reach the care that they need.

B. Women's Health and Nutrition

The women's module of the household survey was administered to one woman between the ages of 15 and 49 in each household. A total of 5,341 women were interviewed; 2,568 in the SC program area and 2,773 in the CRS program area; 737 of these women were pregnant or postpartum at the time of the interview. Valid anthropometry measurements were taken for 4,604 women. The results for the two FFP indicators, prevalence of underweight women and women's dietary diversity, are presented in Table 4.4a.

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Table 4.4a. Food for Peace Indicators - Women's Nutritional Status and Dietary Diversity

Women-level FFP indicators by program area [Guatemala, 2013]

	Total	SC	CRS
Prevalence of underweight women ¹	2.1	2.2	2.1
Number of women (15-49 years) measured	4,604	2,202	2,402
Women's Dietary Diversity Score	3.9	3.8	4.0
Number of responding women (15-49 years)	5,341	2,568	2,773

¹ Does not include pregnant or postpartum women (birth within the past two months). Weight for women wearing medium or heavy clothes during the anthropometry exercise was adjusted by subtracting 1.5 kgs. from their original weight reading.

The nutritional status of women was assessed with two anthropometric indicators: Body Mass Index (BMI) and height. To derive these indices, height and weight measurements were taken for women ages 15-49 who were not pregnant or postpartum. Short stature reflects poor socio-economic conditions and inadequate nutrition during childhood and adolescence. A woman is considered to be at risk if her height is below 145 cm. More than half (52 percent) of the women in the program area are less than 145 cm in height.

BMI, expressed as the ratio of weight in kilograms to the square of height in meters (kg/m^2), was used to measure the prevalence of underweight women. A BMI below 18.5 indicates underweight or acute malnutrition and is associated with increased mortality. The majority (62 percent) of women in the survey population have a BMI within the normal range; 2 percent can be considered underweight ($\text{BMI} < 18.5$), and only 0.4 percent are in the moderately to severely underweight range ($\text{BMI} < 17.0$). More than one-third of women (36 percent) are overweight or obese, with 28 percent considered overweight (BMI between 25.0 and 29.9) and 8 percent considered obese ($\text{BMI} \geq 30.0$). Table A9.8 of Annex 9 provides results for BMI measurements for each program area.

The women's dietary diversity score is computed based on nine critical food groups. This validated indicator aims to measure the micronutrient adequacy of the diet and reports the mean number of food groups consumed in the previous day by women of reproductive age (15-49 years). The indicator is tabulated by averaging the number of food groups consumed (out of the nine food groups) across all women. The survey results indicate that women consume, on average, 3.9 of the nine basic food groups. Grains, roots, and tubers (99 percent), other fruits and vegetables (54 percent), green leafy vitamin A-rich vegetables (52 percent), and legumes and nuts (52 percent) are the most frequently consumed basic food groups by women, while organ meat (5 percent) and dairy products (13 percent) are consumed least often. See Table A9.7 in Annex 9 for a breakdown of the results for each food group by program area.

Additional data were collected during the household survey to explore women's health care behaviors. The results for these women's program indicators are shown in Table 4.4b. When 3,549 mothers of children ages 0-59 months were asked about their knowledge of danger signs that indicate treatment is needed, 41 percent were able to name two or more danger signs during pregnancy, 29 percent were able to name two or more neonatal danger signs, and 36 percent were able to name two or more signs of childhood illness.

Of the 689 mothers who experienced health danger signs during pregnancy, 66 percent sought health care. Of the 618 mothers whose child experienced neonatal danger signs, 76 percent sought health care. Of the 1,493 mothers whose child experienced illness danger signs, 85 percent sought health care.

Mothers of children under five years of age who are married or in a union were asked about decision-making behaviors for their own health care and that of their children under five years old. Overall, 63 percent of these women reported that they make decisions about health care for themselves and 97 percent reported that they make decisions for their children either alone or jointly with their partner.

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Table 4.4b. Program-specific Indicators - Women's Health Care Behaviors			
Program-specific indicators by program area [Guatemala, 2013]			
	Total	SAVE	CRS
Awareness and Health Care Seeking (Mothers of children 0-59 months)			
Percentage who recognize two or more pregnancy danger signs*	41.3	37.4	44.7
Percentage who recognize two or more neonatal danger signs	29.5	26.6	32.0
Percentage who recognize two or more childhood illness signs*	35.9	31.7	39.7
Number of responding mothers of children 0-59 months	3,549	1,717	1,832
Percentage seeking health care when pregnancy danger signs are present	65.6	64.0	66.9
Number of responding mothers of children 0-59 months who can identify pregnancy danger signs and suffered any of them during their last pregnancy	689	311	378
Percentage seeking health care when neonatal danger signs are present	76.0	76.4	75.7
Number of responding mothers of children 0-59 months who can identify neonatal danger signs and whose child suffered any of them	618	285	333
Percentage seeking health care when childhood illness signs are present	84.5	85.0	84.2
Number of responding mothers of children 0-59 months who can identify childhood illness signs and whose child suffered any of them	1,493	647	846
Decision Making for Seeking Health Care (Mothers of children 0-59 months - married or in a union)			
Percentage making decisions about health care for themselves ¹	62.6	61.5	63.7
Percentage making decisions about health care for children 0-59 months ¹	96.7	97.0	96.5
Number of responding mothers of children 0-59 months that are married or in a union	3,159	1,544	1,615
* Difference between program areas is statistically significant at $p < .05$.			
¹ Includes joint decision making.			

C. Health Care for Women

a. Prenatal Care

The qualitative data indicate that clinics and midwives are a source of information and resources for pregnant women. During their pregnancy, women reported visiting a health center, seeing a midwife or a combination of both. The following exchange with a female caregiver from Chugüexa I in Quiché illustrates some of the health care options for pregnant women.

Interviewer: Did you have medical care when giving birth?
 Respondent: Yes.
 Interviewer: And when you were four months pregnant you went to the health center then with the midwife, then return to the health center?
 Respondent: Yes because there we are given a card to keep track of pregnancy...
 Interviewer: How many times did you go to the health center for control during pregnancy?

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Respondent: Five times during the nine months, now if it is an eight month pregnancy then I go four times.
Interviewer: How often does the midwife come to visit?
Respondent: The midwife comes two times to see the pregnancy, to see the birth of the baby, she usually comes two weeks before the baby's birth.
Interviewer: What does the midwife do?
Respondent: Comes to examine me, to touch me, to see how the baby is, if it is okay or not.

b. Antenatal Care and Delivery

The few medical conditions and illnesses identified by respondents as being unique to women included problems with menstruation, infections of the uterus, and infections of the mammary glands. A small number of individuals linked these problems to birthing practices. As one respondent in Quetzaltenango shared:

Another thing is when women give birth with midwives. Many times, since they don't take care of themselves, or don't take hygienic measures, they don't clean well or bathe or wash, [and] they get sick. I have seen many women get sick. Even the newborn. That is why they get sick so much. There are many cases of infection.

In the majority of communities (seven out of eight), individuals reported that the majority of births occur at home with the assistance of a midwife. In fact, even in communities where some women gave birth in hospitals or health centers, they did so either out of medical necessity; because another option was not available to them; or, in rare cases, because they felt that individuals at the health centers or hospitals had special expertise for helping with the delivery. One woman in Huehuetenango explained that she made the decision to have her children in the health center, which is a substantial distance from the community in which she lived, "because doctors are there and one doesn't know what to do. But they know, because they are experts."

Even in communities where women give birth in hospitals or medical centers, most respondents reported that they also seek medical care from midwives both prior to and after giving birth in addition to seeking antenatal care from health centers. When asked why they seek antenatal care from health centers, many responded that they receive what some referred to as "prenatal controls" and others referred to as vitamins and supplements such as folic acid and iron. According to respondents, midwives provide services prior to, during, and after birth. A respondent from Quiché describes one of these services, called a *temascal* bath, in the following exchange:

Interviewer: What is a temascal bath for?
Respondent: It is so she births well.
Interviewer: How many times does she bathe in the temascal before giving birth?
Respondent: She (the midwife) comes to bathe the pregnant woman in the temascal every two weeks for two months.
Interviewer: When the child is born, does the midwife come?
Respondent: She comes to bathe the child and the mother in the temascal so that cold doesn't make them sick. She comes for 10 days after the birth of the baby.

While the majority of respondents stated that most women give birth at home and receive the guidance of midwives, there is some indication that this is changing. In one community, Cerro Grande in San Marcos, where most women reported giving birth in the medical centers, some said that midwives are no longer present in their community. The mention of the limited availability of midwives requires further exploration. Birthing practices and the use of traditional birth attendants in antenatal, delivery, and postpartum care should be explored further to better understand the unique roles they play and how their work is coordinated with services offered by medical facilities.

4.5 Children's Health and Nutrition Indicators

A. Stunting, Underweight, and Wasting

Anthropometric indicators for children under five years of age provide outcome measures of nutritional status. Height (length) and weight measurements are taken using standardized procedures and compared with the 2006 WHO Child Growth Standards, which are based on an international sample of ethnically, culturally, and genetically diverse healthy children living under optimum conditions conducive to achieving a child's full genetic growth potential. Use of the 2006 WHO Child Growth Standards is based on the finding that well-nourished children of all population groups for which data exist follow similar growth patterns before puberty.

Weight-for-age takes into account both chronic and acute malnutrition and is often used to monitor nutritional status on a longitudinal basis. Children who are less than two standard deviations (SDs) below the median of the WHO Standards population in terms of weight-for-age may be considered underweight.

The height-for-age index provides an indicator of linear growth retardation (stunting) among children. Children who are less than two SDs below the median of the WHO Standards population in terms of height-for-age may be considered short for their age ("stunted") or chronically malnourished. Severe linear growth retardation ("stunting") reflects the outcome of a failure to receive adequate nutrition over a number of years and is also affected by recurrent and chronic illness. Height-for-age, therefore, represents a measure of the long-term effects of malnutrition in a population and does not vary appreciably according to the season of data collection.

Weight-for-height is a measure of acute malnutrition or wasting, a predictor of child mortality. Children who are less than two SDs below the median of the WHO Child Growth Standards population in terms of weight-for-age are considered wasted.

Valid height and weight measurements were obtained for a total of 5,556 children ages 0-59 months; 2,578 in the SC program area and 2,978 in the CRS program area. These measurements were used to calculate three indicators:

- Prevalence of underweight children ages 0-59 months (weight-for-age)
- Prevalence of stunted children ages 0-59 months (height-for-age)
- Prevalence of wasted children ages 0-59 months (weight-for-height)

Table 4.5a provides the results for these anthropometric indicators.

A total of 31 percent of children under five years of age in the survey population showed signs of being moderately or severely underweight (less than two SDs below the median). Figure 4.5a shows that the proportion of underweight children is lowest among children ages 0-6 months (10 percent) and highest among those ages 18-23 months (42 percent). There are more underweight children in the CRS program area (35 percent) than in the SC program area (26 percent).

A very high percentage (77 percent) of children under five years of age in the survey population show signs of moderate and severe stunting (less than two SDs below the median). Rates of stunting are higher in the CRS program area (80 percent) than the SC program area (75 percent).

Figure 4.5b shows that the prevalence of stunting increases as the age of the child increased, with the highest prevalence of chronic malnutrition found in children ages 18-23 months (88 percent) and lowest in children ages 6-8 months (45 percent).

Finally, the prevalence of wasting is low, with only 2 percent of children under five years of age in the survey population showing signs of moderate and severe wasting (less than two SDs below the median). Rates of wasting are slightly higher in the CRS program area (2 percent) than the SC program area (1 percent).

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Table 4.5a. Food for Peace Indicators - Children's Nutritional Status
Child-level FFP indicators by program area and sex [Guatemala, 2013]

	Total	SC	CRS
Children's Nutritional Status (Children 0-59 months)			
Prevalence of underweight children (weight-for-age)			
Male*	32.9	27.3	37.6
Female*	28.8	25.5	31.4
Total*	30.8	26.4	34.5
Prevalence of stunted children (height-for-age)			
Male	78.7	77.1	80.0
Female*	76.1	72.3	79.3
Total*	77.4	74.7	79.6
Prevalence of wasted children (weight-for-height)			
Male*	2.0	0.8	3.0
Female	1.0	1.2	0.9
Total*	1.5	1.0	2.0
Number of children (0-59 months) measured			
Male	2,772	1,281	1,491
Female	2,784	1,297	1,487
Total	5,556	2,578	2,978

* Difference between program areas is statistically significant at $p < .01$.

Figure 4.5a. Prevalence of Underweight Children Ages 0-59 Months by Age Group (Months)

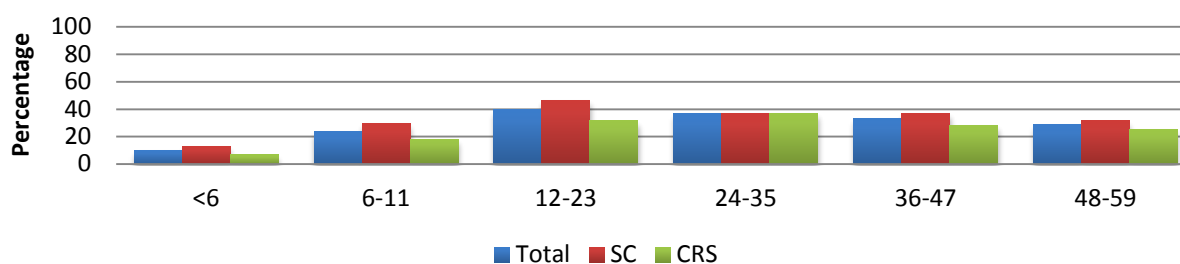
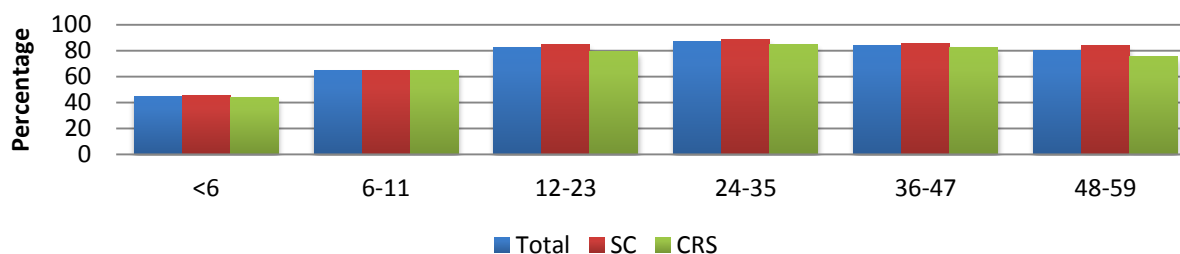


Figure 4.5b. Prevalence of Stunted Children Ages 0-59 Months by Age Group (Months)



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a. Predictors of Household Hunger

To understand factors that might influence stunting, OLS regression models were run for HAZ scores of children under five years of age for the overall survey area and separately for each program area. Table A8.2 in Annex 8 shows statistical results for these models. Table A8.2 also shows the β coefficients for each individual predictor. In a multiple OLS regression model, the β coefficient indicates the change in the outcome for a unit increase in the predictor, with all other predictors in the model held constant.

HAZ is a continuous variable that indicates the difference, in SDs, between the child's height and the median height for children of the same sex and age in the reference population used for the WHO anthropometry standards. Children are considered "moderately and severely stunted" when they are two SDs below the WHO standard height for their age. Thus, even though "stunting" is a categorical variable and HAZ is a continuous variable, the two are related so that when HAZ scores increase, stunting rates decrease. Independent variables in the model include the following:

- Demographic characteristics of the child: Sex, age, age squared, a sex-by-age interaction term, and diarrhea status in the last two weeks
- Household composition: Number of prime-aged adults (15-49 years old), number of elder dependents (50 or older), number of young dependents (5-14 years), number of children (0-4 years)
- Demographic characteristics of the head of household: Sex, age
- Education level of primary caretaker
- Socioeconomic status: Household hunger, household poverty, and food consumption
- Household water and sanitation: Improved source of drinking water, water treatment prior to drinking, improved, not shared sanitation facility, cleansing agent and water available at hand washing station
- Household agricultural status: Raised crops in the last 12 months, number of farmers in the household, used at least two sustainable livestock practices, used at least two sustainable crop practices, used at least one sustainable NRM practice, practiced value chain activities, used improved storage practices
- Department

Both the SC model ($R^2 = .19$) and the CRS model ($R^2 = .25$) show a moderately low explanatory power, indicating that the independent variables in the models explain between one-fifth and one-fourth of the variance in HAZ, respectively. As the significant constant term indicates (see Annex 8), HAZ is different from zero even after controlling for all the independent variables in the model, suggesting that better-fitting models would require collecting additional predictors beyond those in the current survey.

The overall model showed that program differences are significant, so predictors are presented separately for each program rather than overall.

Save the Children (SC) program area

Significant positive predictors (those resulting in lower rates of stunting) for the SC program area include the following:

- Sex: All other factors in the model being equal, female children have on average a HAZ that is 0.39 higher than male children. A significant sex-by-age interaction term indicates that even though, on average, female children have a higher HAZ than males, the rate of growth for female children is slower than males as they get older.
- Number of adults ages 15-49: Each additional adult ages 15-49 in the household is associated with an increase in HAZ of 0.08.
- Education level of primary caretaker: Having a primary caretaker with primary-level or higher education is associated with an increase in HAZ of 0.11.

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- Daily per capita food consumption: Each additional log of GTQ spent on food during the last week is associated with an increase in HAZ of 0.46. Using untransformed food consumption, the increase for each additional GTQ would have a significant but minimal effect, increasing HAZ by 0.01.
- Water treatment prior to drinking: Children who live in households that treat their drinking water have a HAZ that is 0.22 higher, on average, than children who live in households that do not treat their drinking water. The use of an improved source of drinking water did not show an effect on HAZ. A post-hoc analysis of the effect of specific water sources on HAZ shows that sources of drinking water that are improved by definition, including public standpipes ($\beta = -.33$, $p = .01$) and rain water ($\beta = -.27$, $p = .02$), are associated with significantly lower HAZ scores, suggesting that in the SC program areas, sources of drinking water may be less safe than assumed.
- Use of two sustainable NRM practices in past 12 months: Use of sustainable NRM practices is associated with an increase in HAZ of 0.85. However, post-hoc analyses did not identify a specific NRM practice driving this result.

Significant negative predictors (those resulting in higher rates of stunting) for the SC program area include the following:

- Age: Each additional month of age is associated with a decline of 0.07 in HAZ, indicating that the delay in growth accumulates as the child gets older. As the significant and positive “age in months squared” term indicates, this decline in HAZ is faster during the first months of life. A visual inspection of the age-by-HAZ scatterplot shows that the delay of growth decelerates after 20 months of age.
- Number of young dependents (ages 5-14): Each additional young dependent in the household is associated with a decrease in HAZ of 0.06.
- Number of children (under five years): Each additional child under five years in the household is associated with a decrease in HAZ of 0.14.

Catholic Relief Services (CRS) program area

Significant positive predictors (those resulting in lower rates of stunting) for the CRS program area include the following:

- Sex: All other factors in the model being equal, female children have, on average, a HAZ that is 0.21 higher than male children. The significant sex-by-age interaction term indicates that even though, on average, female children have a higher HAZ than males, the rate of growth for female children is slower as they get older.
- Number of adults ages 15-49: Each additional adult ages 15-49 in the household is associated with an increase in HAZ of 0.07.
- Number of elder dependents: Each additional elder dependent in the household is associated with an increase in HAZ of 0.10. This result suggests that elder “dependents” in the CRS areas may in fact be net contributors to household HAZ outcomes.
- Education level of primary caretaker: Having a head of household with primary-level or higher education is associated with an increase in HAZ of 0.15.
- Daily per capita food consumption: Each additional log of GTQ spent in food during the last week is associated with an increase in HAZ of 0.37. Using untransformed food consumption, the increase for every additional GTQ would have a significant but minimal effect, increasing HAZ by 0.02.
- Water treatment prior to drinking: Children who live in households that treat their drinking water have a HAZ that is 0.33 higher, on average than children who live in households that do not treat their drinking water. As in SC areas, the use of an improved source of drinking water does not show an effect on HAZ. The post-hoc analysis of the effect of specific water sources on HAZ did not identify any significant effect of water sources on HAZ.

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- Improved sanitation facilities: Use of an improved sanitation facility is associated with an increase in HAZ of 0.13. A post-hoc analysis on the types of facility associated with HAZ outcomes identified flushed toilets to piped sewer systems (shared or not) and unspecified “other” toilets as having a positive effect on HAZ scores. Latrines (not shared $\beta = -.41$, $p = .01$, shared $\beta = -.49$, $p = .02$), pit latrines without a slab ($\beta = -.43$, $p = .01$) or having no facility ($\beta = -.70$, $p = .00$) are all associated with lower HAZ scores.
- Cleansing agent and water available at hand washing station: Having soap or ash and water available at the hand washing station is associated with an increase of 0.24 in HAZ.

Significant negative predictors (those resulting in higher rates of stunting) for the CRS program area include the following:

- Age: Each additional month of age is associated with a decline of 0.08 in HAZ, indicating that the delay in growth accumulates as the child gets older. As the significant and positive “age in months squared” term indicates, this decline in HAZ is faster during the first months of life. A visual inspection of the age-by-HAZ scatterplot shows that delay in growth decelerates after 20 months of age.
- Child diarrhea: Diarrhea in the past two weeks was associated with a decrease in HAZ of -0.12.
- Number of young dependents (ages 5-14): Each additional young dependent in the household is associated with a decrease in HAZ of 0.04.
- Number of children (ages 0-4): Each additional child in the household is associated with a decrease in HAZ of 0.16.
- Poverty: Living below the poverty line is associated with a decrease in HAZ of 0.25.
- Used two sustainable crop practices (past 12 months): Use of sustainable crop practices is associated with a decrease in HAZ of 0.24. Post-hoc analyses identified use of native corn seeds and soil conservation practices as the specific practices driving this result.

A surprising result concerns the negative effect of sustainable crop practices. While the current model cannot determine whether this association is causal, one causal possibility would be that the use of native corn seeds is associated with decreased yields. An alternative explanation would be that the use of native corn seeds is related to HAZ through a third variable—for example, lack of access or preference for improved seeds, which in turn might be related to location or socio-demographic status. The negative effect of soil conservation practices on HAZ might also be explained by a third, unobserved variable. Households using soil conservation practices may be more likely to have sloped agricultural land, which may in turn be related to poorer agricultural yields.

b. Malnutrition

In the qualitative interviews, malnutrition was a commonly mentioned problem across all communities. When asked whether malnutrition is a problem in their community, most respondents answered that it is, however most also reported that it is not a problem in their own family. Some individuals stated that poor nutrition leads to other medical problems, such as this respondent from in San Marcos:

I think mainly, the first thing that is lacking is good nutrition. From there it will cause you not to be as strong as you should be. Then you are going to get the flu very often. You will also get stomach diseases as a result of malnutrition.

Analysis of the qualitative focus group and interview data revealed a diverse understanding of the causes of malnutrition, how to identify it, and proposed solutions. Although some respondents stated that they had never heard the term “malnutrition” or that it did not exist in their communities, the majority of respondents stated that malnutrition is a problem affecting children in the community. However, respondents rarely mentioned knowing of a child in their immediate or extended family who suffered from malnutrition. Respondents stated that the causes of malnutrition included poverty, lack of work or employment opportunities, poor hygiene, limited food supply, no vitamins, improper nutrition, lack of breast milk, poor health of the mother, and limited knowledge of parental responsibility. While KIs stated

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that limited dietary diversity is a key contributing factor to malnutrition, respondents rarely mentioned dietary diversity as a critical factor. When asked how they would identify a malnourished child, respondents listed identifiers such as thinness, weight loss, pale skin, yellow eyes, lack of energy, and frequent illness. The majority of respondents were also unable to identify community efforts to help reduce malnutrition, yet some stated the health center was a potential resource.

The main solutions discussed involved working or employment. For example, a female head of household from Totonicapán stated:

I have seen on the news that those who suffer from malnutrition the most are the poor because they lack employment and money. Without that you can't do anything, but it would be good if the government would help with solidarity bags because many are being given those, but not them.

Other proposed solutions include going to the clinic, giving the child vitamins, improving maternal nutrition, limiting the number of children one has, and education.

B. Diarrhea and Oral Rehydration Therapy (ORT)

Dehydration caused by severe diarrhea is a major cause of morbidity and mortality among young children, although the condition can be easily treated with oral rehydration therapy (ORT). Exposure to diarrhea-causing agents is frequently related to the use of contaminated water and to unhygienic practices in food preparation and disposal of excreta. Caretakers were asked whether any children under age 5 had diarrhea at any time during the two-week period preceding the survey. If the child had diarrhea, the caretaker was asked about feeding practices during the diarrheal episode, whether they sought advice or treatment, and whether ORT was given to the child. Types of ORT provided included Oral Rehydration Salts (ORS), homemade rehydration fluids, and increased fluid intake. The caretaker was also asked whether there was blood in the child's stools. Diarrhea with blood in the stools should be treated differently from diarrhea that is not accompanied by blood in the stools.

Table 4.5b provides the results for the two FFP indicators—the percentage of children with diarrhea in the past two weeks and the percentage of children with diarrhea treated with ORT. Overall, 37 percent of all children under age 5 had diarrhea in the two weeks preceding the survey. Of the children with diarrhea, 11 percent had blood in their stools. Rates of diarrhea are significantly higher in the CRS program area (43 percent) compared to the SC program area (29 percent).

Table 4.5b. Food for Peace Indicators - Children's Diarrhea and ORT
Child-level FFP indicators by program area and sex [Guatemala, 2013]

	Total	SC	CRS
Children's Diarrhea and ORT (Children 0-59 months)			
Percentage of children who had diarrhea in the last two weeks			
Male*	37.3	29.0	44.1
Female*	35.5	28.7	41.1
Total*	36.4	28.8	42.6
Number of children (0-59 months)	5,680	2,632	3,048
Percentage of children with diarrhea treated with ORT ¹			
Male	50.4	55.4	47.7
Female	51.0	51.2	51.0
Total	50.7	53.3	49.3
Number of children (0-59 months) with diarrhea	1,988	741	1,247

* Difference between program areas is statistically significant at $p < .01$.

¹ Includes ORS, home-made rehydration fluids, or increased fluids.

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Caretakers seek advice or treatment for 72 percent of the children with diarrhea, and half of these children are treated with ORT. Of those children with diarrhea who are treated with ORT, homemade rehydration fluids are used for 26 percent, ORS are used for 27 percent, and an increase in fluid intake was used for the remaining 47 percent.

As discussed in the Childhood Illness section below, diarrhea was one of the commonly discussed childhood illnesses during the qualitative interviews. Respondents not only recognized the symptoms but also know of prevention measures and forms of treatment, as illustrated in the following exchange:

Interviewer: When you said, a while ago, that they have had stomachache, did they also have diarrhea or no?
Respondent: Yes.
Interviewer: Why does diarrhea take place? Why did they have diarrhea?
Respondent: Well.... Sometimes because of something that one eats and they don't wash their hands thoroughly; something like that causes diarrhea.
Interviewer: What are the symptoms? How do you realize that they have diarrhea?
Respondent: Because they have watery and not hard stool.
Interviewer: ...What do you do to treat diarrhea?
Respondent: We immediately give them remedy.
Interviewer: Like what type of remedy?
Respondent: Since they are some small pills called alka-d...
Interviewer: Where do you find that?
Respondent: In the stores that are here or in Uspantán...
Interviewer: What have you or your family members done to treat diarrhea?
Respondent: Take care of them, wash their hands, and don't eat things that are not washed.

Another respondent when asked what treatment she gave her child for diarrhea stated, “[I] take them to the health care center, prepare home water or homemade solution. That helps them a lot.” Although few respondents stated they did not treat their children for diarrhea, similar to the household survey results the majority of respondents sought some form of treatment.

C. Minimum Acceptable Diet (MAD)

Adequate nutrition during the period from birth to two years of age is critical for a child's optimal growth, health, and development. This period is one marked for growth faltering, micronutrient deficiencies, and common childhood illnesses such as diarrhea and acute respiratory infection (ARI). Adequate nutrition requires a minimum dietary diversity, which is measured in terms of seven key food groups. In addition to dietary diversity, feeding frequency (i.e., the number of times the child is fed) and consumption of breast milk (or other types of milk or milk products) needs to be considered. All three dimensions are aggregated in the MAD indicator. This indicator measures the percentage of children 6-23 months of age who receive a MAD, apart from breast milk. The MAD indicator measures both the minimum feeding frequency and minimum dietary diversity, as appropriate for various age groups. If a child meets the minimum feeding frequency and minimum dietary diversity for his or her age group and breastfeeding status, the child is considered to be receiving a MAD.

Results for the MAD indicator are shown in Table 4.5c. A total of 1,822 children ages 6-23 months were included in the survey—893 in the SC program area and 929 in the CRS program area. Overall, 20 percent of these children are receiving a MAD.

Figure 4.5b shows that the percentage of breastfed children ages 6-8 months and ages 9-23 months with a minimum meal frequency of either two or three meals a day was significantly higher (66 and 72 percent) compared to the percentage of non-breastfed children ages 6-23 months with a minimum meal frequency of four meals plus 2 servings of milk (11 percent). The proportion of children with a minimum dietary diversity of four or more food groups was low: 18 percent for breastfed children 6-8 months, 31 percent for breastfed children ages 8-23 months, and 28 percent for non-breastfed children ages 6-23 months.

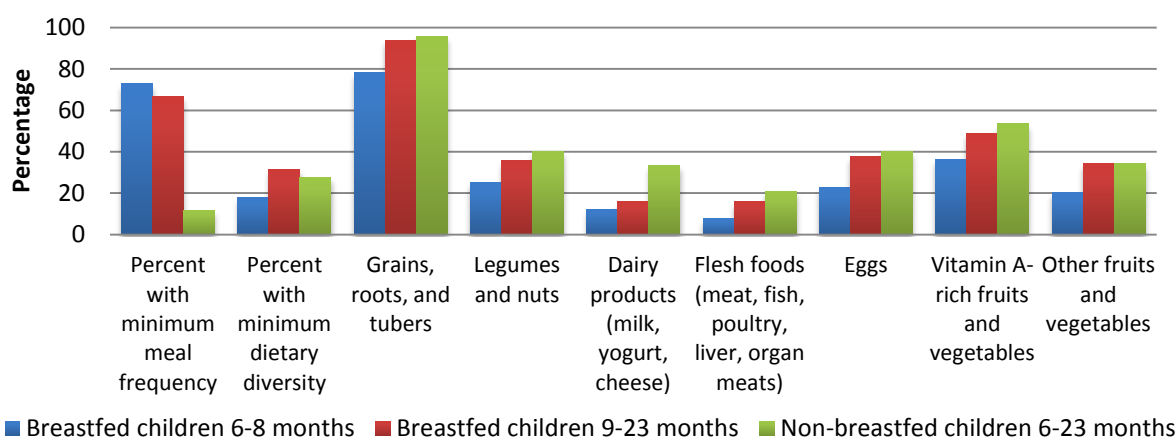
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Table 4.5c. Food for Peace Indicators - Children's Minimum Acceptable Diet (MAD)

Child-level FFP indicators by program area and sex [Guatemala, 2013]

	Total	SC	CRS
Minimum Acceptable Diet (Children 6-23 months)			
Prevalence receiving a minimum acceptable diet			
Male	19.5	22.0	17.4
Female	20.3	22.3	18.5
Total	19.9	22.1	17.9
Number of children (6-23 months)	1,822	893	929

Figure 4.5b. Components of MAD by Age Group and Breastfeeding Status



D. Breastfeeding

Breastfeeding is an important factor in predicting the future health of children. Research indicates a strong link between breastfeeding and the development of a child's immune system.³⁹ UNICEF and WHO recommend that children be exclusively breastfed (no other liquid or solid food or plain water) during the first six months of life and that children be given solid/semisolid complementary food in addition to continued breastfeeding beginning when the child is six months old and continuing to two years and beyond. Introducing breast milk substitutes to infants before six months of age can contribute to limiting breastfeeding, which has negative implications for a child's health and development. Substitutes such as formula, other kinds of milk, and porridge are often watered down and provide too few calories. Lack of appropriate complementary feeding may lead to malnutrition, frequent illnesses, and possibly death.

There were 642 children under six months in the survey households. Table 4.5d provides the results for the exclusive breastfeeding indicator. Overall, 64 percent of these children are exclusively breastfed. There were no significant differences in exclusive breastfeeding between program areas. Figure 4.5c shows that the prevalence of exclusive breastfeeding is highest in the 0-3 month range (70 percent) and gradually decreases with each two-month age group thereafter. About 32 percent of children in the 18-23

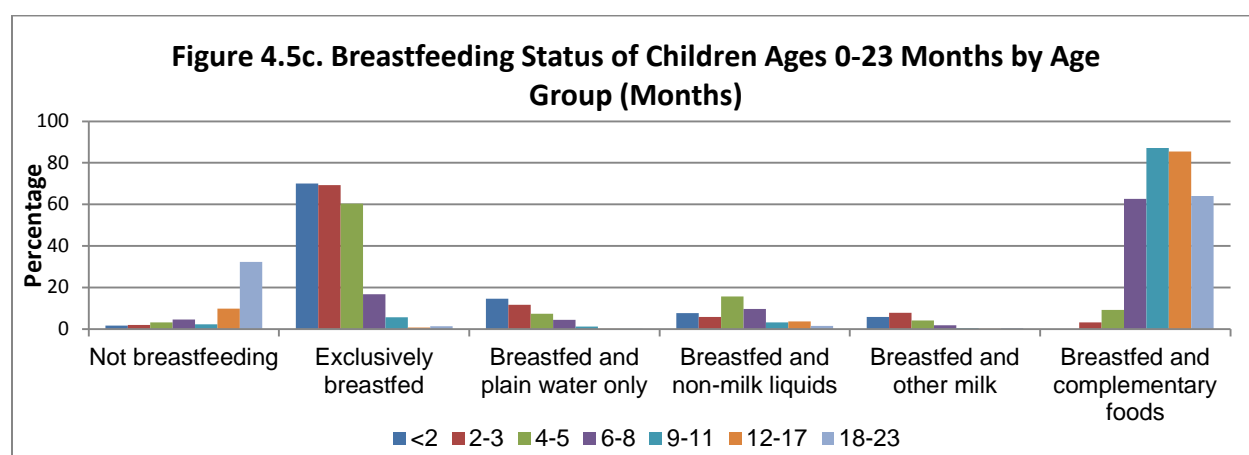
³⁹ See the following for more information on breast milk and the immune system: Slade, H. B., & Schwartz, S. A., Mucosal immunity: The immunology of breast milk, *J Allergy Clin Immunol* 1987 Sep;80(3 Pt 1):348-58; Cunningham, A. S., Jelliffe, D. B., & Jelliffe, E. F. Breast-feeding and health in the 1980s: A global epidemiologic review, *J Pediatr* 1991 May;118(5):659-66; and Goldman, A. S., The immune system of human milk: Antimicrobial, anti-inflammatory and immunomodulating properties. *Pediatr Infect Dis J* 1993 Aug;12(8):664-71.

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month age range are no longer breastfeeding, while 64 percent are breastfeeding with the addition of complementary foods.

Table 4.5d. Food for Peace Indicators - Exclusive Breastfeeding
Child-level FFP indicators by program area and sex [Guatemala, 2013]

	Total	SC	CRS
Exclusive Breastfeeding (Children under six months)			
Prevalence of exclusive breastfeeding			
Male	65.5	69.4	61.6
Female	61.1	61.6	60.7
Total	63.4	66.1	61.1
Number of children under six months	642	300	342



Similar to the findings from the household survey, the majority of focus group and interview participants stated they exclusively breastfeed their children six months of age and under. Decision making around breastfeeding is either primarily made by the woman or jointly between the woman and her husband. Information about breastfeeding practices usually comes from parents, other family members, or health centers. Respondents utilize information gathered from prior trainings and other sources as justification of the importance of breastfeeding. For example, a male head of household from Quetzaltenango stated:

According to a training that we had before, we were told that it was necessary and important to breastfeed the children, what they call breast milk. Since women consume any kind of food, then the breast milk has a lot of nutrients for the kid to be well nourished. But when the kid is one or two years old, they stop breastfeeding him, then we have to buy him a little bit of everything so he can eat on his own, also for his blood to be nourished.

Respondents viewed breast milk as ideal. In response to the question of which children are breastfed, a male care giver from San Marcos stated:

Because in the first place, breast milk is better than buying cans, in second place there are none or weren't enough financial resources to be able to buy it because canned milk is expensive. And then, because breast milk is good for them, it prevents diseases.

Although most participants stated that they exclusively give their children breast milk, some said they give their children other beverages in the event that their breast milk is insufficient. For example, a female farmer from Quiché stated, "With the youngest I didn't have milk, so I gave him sugar water." A KI from SC echoed this sentiment, "They start giving children beverages that are not dense enough, with very low nutritional value, and that are introduced very early and sometimes come to substitute breastfeeding."

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Reports of when respondents begin to wean their children ranged from six months to one and a half years, with the majority of respondents stating that after six months, they begin introducing supplemental foods to their children. The introduction of supplemental foods poses some risk to the child's nutritional intake. According to one KI, "after the breastfeeding stage, the children begin to eat foods that do not have all the requirements needed for a growing child." Therefore, as illustrated in the household survey, the majority of children above six months of age are not receiving the minimum acceptable diet.

E. Childhood Illness

Primary childhood illnesses identified in the qualitative interviews included flus; fevers; respiratory health problems/infections such as colds, coughs, bronchitis, and pneumonia; and digestive/gastrointestinal problems such as diarrhea, worms, and stomachaches. Respondents also discussed "evil eye" as an illness that affects children and something for which they seek treatment from natural or traditional healers or try to cure themselves. A male head of household from Totonicapán stated:

Well, what we do here, my wife sometimes cures the children, and another disease is evil eye that we get often.... My wife sees the little girl, and if she has evil eye, she cures her with natural medicine with some plants, or pills that she buys that always helps. If there is no improvement, we go to the doctor.

Two primary causes of illness mentioned by respondents were improper hygiene and children's exposure to the elements, particularly during the rainy season. Several respondents were aware of causes of diseases and ways to prevent them. For example, a female head of household from Quetzaltenango, when asked what she thought was the cause of diarrhea, stated, "They may suffer from parasites, in these times by water or an oversight, eating with dirty hands and not washing the fruits that they are eating."

Most respondents reported using different forms of treatment, including medications for specific illnesses, home remedies, or seeking care from either natural/traditional healers or the health center. Yet, there were still respondents who are unaware of both the causes of illness and possible prevention measures.

Health centers were mentioned as a source of information for illness prevention measures and the source for vaccinations for their children. The majority of respondents were able to identify the vaccinations their children received and were aware of the important role vaccines play in the prevention of diseases. Respondents also discussed vaccinations as accessible and affordable, with several respondents stating that they do not have to pay to receive vaccinations for their children. Although the treatment is free, some respondents mentioned the cost of transportation as a challenge in seeking care. Besides vaccinations for childhood illnesses, respondents also mentioned that children receive flu vaccines and vitamins to prevent illness.

5. Conclusions

Data for the baseline study of Title II development food assistance programs in Guatemala was collected from April to June of 2013 in approximately 6,000 households in five departments in the Western Highlands. The household survey collected data for FFP and program indicators with regard to household hunger and food access; sanitation and hygiene; agriculture, household expenditures and assets; and dietary diversity and anthropometry among women and children. The qualitative surveys collected additional data through interviews and focus groups with potential beneficiaries and key informants.

In line with the overall objective of the baseline study, key findings and conclusions with respect to the FFP and program-specific indicators are described below. These conclusions are based on findings from the household survey and the qualitative component. Results from the regression models are provided but should be interpreted cautiously due to the low explanatory value of the independent variables in the models. Additional analysis of data is possible, and the household survey data files are available for in-depth analyses to further inform program design and monitoring.

5.1 Household Hunger

A small minority of households (7 percent) suffers from moderate or severe hunger, with a similar proportion in the SC and CRS program areas. These results indicate that frequent episodes of food deprivation within the past four weeks were not a significant challenge for most households in the program area during the April to June period.

Participants in the qualitative interviews and focus groups rarely discussed experiences of hunger and often stated that there is always something to eat. They attributed lack of food to lack of income and also stated that plot size is a limiting factor in the diversity and quantity of their production. Strategies for coping with low yields and low household income include migration for better employment and income-producing opportunities, and reduced food consumption.

Results of regression models for household hunger

The SC household hunger model indicates that increasing the practice of value chain activities, particularly calculating costs and having a production plan, are factors that tend to reduce household hunger in the SC program area; these activities are linked to increased household income. The models also indicate that household hunger reduction activities in the SC program areas might focus on female-headed households and those with fewer farmers, as these households are more likely to suffer from household hunger.

For the CRS program area, the model indicates that increasing the education level of the head of household would have the greatest impact on household hunger. The data also indicates that household hunger reduction activities in the CRS program area might focus on those households with fewer prime-aged adults, as these households are more likely to suffer from household hunger.

5.2 Household Dietary Diversity

The HDDS for survey participants is moderate, with half of the 12 food groups consumed daily in each household, on average. Results are similar for the two program areas. The dietary diversity score as a measure of food access and socio-economic status indicates moderate economic means to allow access to a diverse selection of foods.

Foods made from cereals and grains are the staple of household diets and are consumed by nearly all households. Nearly all households (94 percent) consume sugar or honey, and more than two thirds (78 percent) consume other foods such as coffee, tea, spices, sweets, and chocolates. The qualitative data indicate that the most common beverages consumed are water, water with sugar, (corn) *atole*, (corn) *gruel*, coffee, and tea.

Qualitative data indicated that accessibility of food is variable and influenced by a number of factors, such as the season (rainy versus dry), the success of crop production, storage capabilities, and access to an income that allows for the purchase of food. Respondents indicated that food items are both purchased and produced, and sources of food varied significantly by household and by season. Overall, both KIs and PDBs expressed the importance of additional income and food production as a way to increase access to more diverse foods.

5.3 Poverty Levels

Poverty is a significant challenge in the Western Highlands region. The household survey found that nearly one-half (44 percent) of the population in the survey area is living in extreme poverty (less than \$1.25 USD per day), which is substantially higher than the 13.5 percent for Guatemala as a whole⁴⁰. Daily per capita expenditures are, on average, \$1.90 USD per day, per person. The mean depth of poverty is 11.9 percent in the overall program area.

⁴⁰ [World Development Indicators. World Bank](http://databank.worldbank.org/data/home.aspx). July 9, 2012. Retrieved from <http://databank.worldbank.org/data/home.aspx>

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Many survey households rely on subsistence farming with limited opportunity for income generation. Respondents in the focus groups and qualitative interviews discussed their limited ability to meet all household needs based on one source of income. Women's ability to support the household is limited by the general tendency for their incomes to be significantly lower than men's. One common strategy for coping with limited income involves migration internally within Guatemala or externally to the U.S. in order to earn higher wages as agricultural laborers. In order to meet household needs, respondents from the qualitative study reported the need to diversify their income sources or rely on pooled income from several members of the household.

Across all departments, respondents from the qualitative study identified few primary sources of income. These include small-scale agricultural production (both the sale of crops and animal rearing), casual and opportunistic labor, masonry, and work acquired both through internal and external migration. In addition, respondents residing in the communities serviced by CRS mentioned textiles, selling handmade clothing, and handcrafts as additional sources of income. Although respondents discussed men as primary providers, women also bring income into the households. Common income sources for women include the keeping and selling of livestock, washing clothes for neighbors, and making clothing for sale. In households where income is insufficient to meet household needs, children are also involved in income-generating activities or responsible for assisting parents in their income-generation activities.

5.4 Water, Sanitation, and Hygiene

In both program areas, about 20 percent of households use an improved drinking water source. Although 48 percent of households have access to an improved water source, only 65 percent reported that water is generally available from the source. About 52 percent of households do not use an improved drinking water source, but use surface water from sources such as rivers, lakes, dams, canals, and so forth. Nearly all households (93 percent) reported boiling the water to make it safer to drink. Access to and use of an improved drinking water source in the program areas is substantially lower compared to the national average of 92 percent reported by the UNICEF Joint Monitoring Programme in 2012.⁴¹

About half of households (52 percent) use a non-shared improved sanitation facility, generally a pit latrine slab (41 percent). Use of improved sanitation facilities in the program areas is lower than the nationally reported average of 78 percent.⁴² In general, qualitative focus group and interview data indicated that the majority of individuals want to improve their existing latrines and that those who do not have latrines recognize their importance.

Interviewers observed soap, detergent, or another cleansing agent at the place for hand washing in 77 percent of households in the survey. However, qualitative findings indicate that while hand washing with water takes place frequently, soap use is sometimes limited to instances where hands are visibly dirty. Respondents reported financial limitations to purchasing soap.

Poor sanitation practices are associated with increased morbidity and mortality, particularly for diarrheal diseases. Worldwide, it is estimated that improved water sources reduce diarrhea morbidity by 21%; improved sanitation reduces diarrhea morbidity by 37.5%; and the simple act of washing hands at critical times can reduce the number of diarrhea cases by as much as 35%.⁴³ Programs should consider further activities that will result in better access to and use of improved drinking water sources and improved sanitation facilities as well as educational activities to emphasize hand washing at critical moments.

⁴¹ WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation (JMP), *Progress on Sanitation and Drinking Water, 2012 Update*. Retrieved from http://www.wssinfo.org/fileadmin/user_upload/resources/JMP-report-2012-en.pdf

⁴² Ibid.

⁴³ World Health Organization, *Facts and Figures: Water, sanitation and hygiene links to health*, retrieved from http://www.who.int/water_sanitation_health/publications/factsfigures04/en/print.html

5.5 Agriculture

The majority of farmers (95 percent) in the household survey reported cultivating corn, and about two-thirds reported cultivating beans. Around a third (38 percent) of farming households cultivated herbs or vegetables for household consumption, and more than half (58 percent) reporting having fruit trees on their land. Livestock was raised in 87 percent of farming households. Qualitative data indicate that men are typically responsible for crop production and women are responsible for the rearing of animals.

Most farmers (92 percent) consume products from their livestock or land, and 44 percent of farmers sell products from their livestock or land. Qualitative data identified three general trends for crop sales and consumption: (1) some communities produce certain crops exclusively for sale; (2) for most other crops, farmers sell their surplus after calculating their own need; and (3) the majority of livestock and poultry raised by individuals serve as sources of income, with about 20 percent consumed by the household.

Overall, only 14 percent of farmers reported practicing at least two value chain activities, most commonly market-oriented production. More farmers in the SC program area practice value chain activities (16 percent) compared to the CRS program area (11.5 percent). A higher proportion (50 percent) of farmers reported using at least three sustainable agricultural practices, such as use of organic fertilization or use of improved livestock facilities; however, only 8 percent of farming households reported using improved storage practices, such as grain silos.

According to the household survey results, only 16 percent of farmers reported using financial services in the past 12 months—either savings, credit, or insurance. More farmers in the SC program area (20 percent) used financial services than in the CRS program area (13 percent). A key challenge to agriculture cited during qualitative interviews was the lack of financial resources to invest in products to increase their yield, such as fertilizer, insecticides, and seed.

Other challenges mentioned by qualitative respondents included insufficient access to vaccinations for animals, the need for further technical assistance to help improve agricultural practices, and reliable access to a water source. Additionally, qualitative respondents reported lack of access to adequate land. Large family sizes have resulted in the repeated division of property, which has led to small, inefficient plots. Land tenure is strongly disputed in some areas, and large commercial agriculture operations own much of the most fertile land. Another factor limiting production, as reported by some individual farmers in the qualitative study, is the lack of cooperation and organization with neighboring farmers. Without cooperation, farmers are limited in their ability to diversify crops, carry out projects requiring many sources of labor, and solicit buyers for bulk produce.

Programs might consider delivery of trainings focused on the use of sustainable agricultural practices, value chain activities, and improved storage techniques. Better access to financial services and encouragement of farming groups or associations might also help to improve agricultural production.

5.6 Women's Health and Nutrition

The anthropometry results indicate significant nutritional challenges for women ages 15-49 (reproductive age) in the survey population. While these women appear to be consuming sufficient or even excessive calories, their heights show that during childhood and adolescence their nutritional intake was insufficient. More than half (52 percent) of these women are short in stature (less than 145 cm). Similar results were found in the 2008-2009 ENSMI where 42.6 percent of non-pregnant women of reproductive age from households with children under five years in the Western Highlands are short in stature.⁴⁴

⁴⁴ Chaparro, Camila. 2012. *Household Food Insecurity and Nutritional Status of Women of Reproductive Age and Children under 5 Years of Age in Five Departments of the Western Highlands of Guatemala: An Analysis of Data from the National Maternal-Infant Health Survey 2008–09 of Guatemala*. Washington, DC: FHI 360/FANTA-2 Bridge.

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The majority (62 percent) of women ages 15-49 in the survey population have a BMI within the normal range, with greater rates in CRS program areas (64 percent) than in SC areas (59 percent). The mean BMI for these women is 24.3, which is very similar to the BMI of 24.9 reported in the ENSMI survey. Only 2 percent of the women surveyed are underweight, but more than one-third (36 percent) are overweight or obese. Similar rates were found in the ENSMI survey, with 1.6 percent of the women surveyed being underweight and 32.5 percent being overweight.⁴⁵

The household survey shows that women consume, on average, 3.9 of the nine basic food groups. Almost all consumed grains, roots, and tubers (99 percent), while only around half consumed fruits and vegetables (54 percent), green leafy vitamin A-rich vegetables (52 percent), and legumes and nuts (52 percent). There were no significant differences between the two programs for these indicators. The focus on grains, roots, and tubers over all other food groups likely contributes to the significant portion of overweight women and may contribute to poor health.

Mothers of children under five years of age in general lack sufficient knowledge of the signs of danger during pregnancy, during the neonatal period, and during early childhood. According to the household survey data, under half (41 percent) of these mothers were able to name two or more health danger signs during pregnancy, around one-third (29 percent) were able to name two or more neonatal health danger signs, and 36 percent were able to name two or more childhood illness danger signs. When health danger signs were present, rates for seeking treatment were fairly high: 66 percent when danger signs were present during pregnancy, 76 percent when danger signs were present during the neonatal period, and 85 percent when danger signs of childhood illness were present. Overall, 63 percent of mothers of children under five years of age make decisions about health care for themselves and 97 percent make decisions about healthcare for their children either alone or jointly with their partner.

Future interventions might provide additional training and education to women on healthy eating behaviors including diversifying their diets and recognizing when health danger signs are present.

5.7 Children's Health and Nutrition

The number of underweight and stunted children under five years of age is very high in both SC and CRS program areas. Lack of appropriate nutrition during childhood can have lifelong negative effects for these children in terms of physical health, mental acuity, and economic productivity. More than three-quarters of children (77 percent) under five years of age in the survey show signs of moderate and severe stunting, with greater rates in CRS program areas (80 percent) than in SC program areas (75 percent). UNICEF statistics for the entire country show a stunting rate of 48 percent in children under five years of age⁴⁶ and the ENSMI survey shows a stunting rate of 62.5 percent in children under five years of age in the Western Highlands⁴⁷.

Thirty-one percent of children under five years of age show signs of being moderately or severely underweight, with greater rates in CRS program areas (35 percent) than in SC program areas (26 percent). UNICEF statistics show a 13 percent rate for underweight children under five years in the entire country⁴⁸ and the ENSMI survey shows an 18.7 percent rate for children under five years in the Western Highlands of Guatemala⁴⁹.

Results of regression models for stunting

The multiple regression models identified significant positive predictors (those resulting in lower rates of stunting) for the SC program. They include female sex, having prime-age adults in the household, having

⁴⁵ Chaparro, Camila. 2012.

⁴⁶ UNICEF. (n.d.) *At A Glance: Guatemala*. Retrieved from http://www.unicef.org/infobycountry/guatemala_statistics.html

⁴⁷ Chaparro, Camila. 2012.

⁴⁸ Ibid.

⁴⁹ Chaparro, Camila. 2012.

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an educated head of household, the amount of money spent on food, and water treatment prior to drinking. Significant negative predictors (those resulting in higher rates of stunting) for the SC program area include the number of young dependents (ages 5-14) in the household, and the number of children (under five years) in the household.

Significant positive predictors (those resulting in lower rates of stunting) for the CRS program area include female sex, number of prime-age adults in the household, having an educated head of household, amount spent on food consumption, water treatment prior to drinking, improved sanitation facilities, and use of a cleansing agent and water available at hand washing stations. Significant negative predictors (those resulting in higher rates of stunting) for the CRS program area include child diarrhea in the past two weeks, the number of elder dependents in the household, the number of young dependents in the household, the number of children (ages 0-4) in the household, living below the poverty line, and using two sustainable crop practices in the past 12 months.

MAD and Exclusive Breastfeeding

Only 20 percent of children ages 6-23 months are receiving a MAD. This result is mainly driven by the lack of minimum dietary diversity rather than lack of minimum meal frequency. Respondents in the qualitative focus groups and interviews stated that the causes of malnutrition included poverty, lack of work or employment opportunities, poor hygiene, a lack of or limited food supply, a lack of vitamins, a lack of breast milk, poor health of the mother, and limited knowledge of parental responsibility.

More than half of children ages 0-6 months in the survey area are exclusively breastfed (64 percent), compared to 50 percent of children ages 0-6 months being exclusively breastfed in Guatemala as a whole, according to UNICEF data.⁵⁰ Focus group and interview respondents emphasized the importance of breastfeeding, and many noted that they had heard trainings on the subject, indicating the effectiveness of health education campaigns.

Future programs might work to address dietary diversity in household diets and infant and young child feeding practices, especially during the first 1,000 days of life for the most at-risk children.

Diarrhea and illnesses

The household survey found that 37 percent of children under age 5 had diarrhea in the two weeks preceding the survey, and 11 percent of this subset had blood in their stools. Greater rates of children with diarrhea are found in the CRS program areas (43 percent) than in SC areas (29 percent). Caretakers sought advice or treatment for a majority of the children with diarrhea (72 percent), and half of the children with diarrhea are treated with ORT, with similar rates by program area. Data from the 2002 Guatemala DHS found that only 41 percent of children with diarrhea received either ORS or a recommended home solution.⁵¹

Primary childhood illnesses identified in the qualitative interviews included flus; fevers; respiratory health problems/infections such as colds, coughs, bronchitis, and pneumonia; and digestive/gastrointestinal problems such as diarrhea, worms, and stomachaches. These illnesses likely contribute to the levels of stunting and underweight children as shown in the regression models for stunting. Future programs might strive to improve access to and utilization of maternal and child health services among the target population.

⁵⁰ UNICEF. (n.d.). *At A Glance: Guatemala*. Retrieved from http://www.unicef.org/infobycountry/guatemala_statistics.html

⁵¹ DHS, 2002. Guatemala Country Quick Stats. Retrieved from http://www.measuredhs.com/Where-We-Work/Country-Main.cfm?ctry_id=15&c=Guatemala&Country=Guatemala&cn=&r=6